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- Electronic Journals in the Health Sciences:
The Present Landscape and Horizon
- Harnessing the Whirlwind: Information
Technologies in the Age of Aesculapius
- Social and Technical Dimensions of
Electronic Journals

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BIBLIOTHECA MEDICA CANADIANA

The **Bibliotheca Medica Canadiana** is a vehicle providing for increased communication among all health libraries and health sciences librarians in Canada. We have a special commitment to reach and assist the worker in the smaller, isolated health library.

The **Bibliotheca Medica Canadiana** is published 4 times per year by the Canadian Health Libraries Association. Opinions expressed herein are those of the contributors and the editor and not the CHLA/ABSC.

La **Bibliotheca Medica Canadiana** a pour objet de permettre une meilleure communication entre toutes les bibliothèques médicales et entre tous les bibliothécaires qui travaillant dans le secteur des sciences de la santé. Nous nous engageons tout particulièrement à atteindre et à aider ceux et celles qui travaillent dans les bibliothèques de petite taille et les bibliothèques relativement isolées.

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This is the first of two issues to include papers from the 17th annual meeting of CHLA/ABSC, held in Banff in June. We welcome contributions from Edward Huth, former editor of *Annals of Internal Medicine* and current editor of the *Online Journal of Current Clinical Trials*, Alan MacDonald, Director of Information Services at the University of Calgary, and Brian Gaines, of the Knowledge Science Institute, also at the University of Calgary. Each of these three authors examines the impact of technology on health librarianship, with Gaines and Huth focussing on the electronic journal, providing both visionary and practical insights. Margaret Haines-Taylor adds an international perspective with her description of the resources and services at the King's Fund Centre in London.

A question was raised at the Banff meeting as to how many members the Association has. Disregarding the fact that not all 1992 members have paid their 1993 dues and are therefore not accurately 1993 members (those of you in this category can start writing your cheques now),

we nonetheless have 305 regular members, 125 institutional members, three student members and three emeritus members, for a total of 436. There are thirty additional subscribers to BMC. I am struck again by how small an organization we are and yet also by how much we accomplish despite our size.

The journal of such an organization that meets formally only once a year is an extremely important means of communication. We encourage each chapter correspondent to keep us regularly informed of interesting activities and plans, and also of the accomplishments of and noteworthy changes happening to individual chapter members. We also encourage article submissions from all members and letters in response to issues as they are published. As a start, we would be interested to know how library subscribers to OJCCT react to the Huth and Gaines papers.

Keep in touch!

Sandra Shores, Editor

Editor's Message

1993

PUBLISHING SCHEDULE

Deadlines for submission of articles:

volume 15(3)	3 December	1993
volume 15(4)	25 February	1994
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volume 16(2)	26 August	1994

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A Word from the President

Bev Brown

*Medical Library
University of Manitoba
Winnipeg*

In this issue of **BMC**, the terms of reference for two of the initiatives approved at the Banff annual general meeting – the Strategic Plan and the Development Fund – have been published. Both of these documents belong to the membership. The Strategic Plan will be used by the Board to guide decision-making during upcoming Board meetings. It provides a mechanism to ensure that Board actions are made accountable to members and, for all of us, provides a vision of future directions and priorities.

The Development Fund has grown out of the Strategic Plan as a direct effort to foster chapter growth and activities. Funds have already been budgeted and we would like to have a number of proposals to consider at the Toronto Board meeting, scheduled for October 29 and 30. Chapters and individuals are encouraged to apply not only at this time, but throughout the year. This is your opportunity to undertake a resource-sharing project, sponsor or develop a CE course, or conduct research in the area of health sciences.

The creation of the Development Fund has not meant the demise of the Tenth Anniversary Commemorative Award. The award will still be offered annually to a chapter which has completed or is nearing completion of a project. The emphasis of the award will be on the recognition and acknowledgement of chapter achievement.

The other major undertaking for the Association will be the work of the Task Force on Health Facilities Library Standards. Support for hospital libraries has always been one of the foundations of CHLA/ABSC, more urgently needed now than ever before. The Task Force will work closely with the CHLA/ABSC Representative to CCHFA in demonstrating the role of libraries in contributing to quality improvement through the management of knowledge-based information. The Task Force will build on the achievements of the earlier Task Force in revising the 1989 Hospital Library Standards. The membership of the new Task Force is still being determined, but I look forward to announcing these details in the next newsletter.

As your President this year, one of my objectives is to contact personally each chapter president. This is proving to be a rewarding experience. I am hearing about chapter concerns firsthand and discussing how the national organization can both attend to larger issues while at the same time facilitate local development. I am learning again that well-worn Canadian truth that communication across the country requires not a small expenditure of time and resources. However, the rewards are worth it, and the effort seems only appropriate for a profession whose business is the communication of information and the forging of partnerships. ■

Dans le présent numéro de **BMC**, vous trouverez les paramètres de deux des initiatives approuvées à l'occasion de la conférence annuelle de Banff, soit le plan stratégique et le fonds de développement. Ces deux documents appartiennent aux membres. Le plan stratégique servira à orienter la prise de décisions au cours des prochaines réunions du conseil d'administration. Il s'agit d'un mécanisme qui permet d'assurer la responsabilité du conseil d'administration et qui nous donne à tous une perspective d'avenir quant à nos orientations et nos priorités.

Le fonds de développement est le fruit du plan stratégique. Il vise à favoriser la croissance et les activités des chapitres. Nous avons déjà budgétisé des fonds et nous aimerions pouvoir étudier quelques propositions à l'occasion de la réunion du conseil d'administration qui aura lieu les 29 et 30 octobre à Toronto. En fait, on encourage les chapitres et les particuliers à présenter une demande de fonds à tout moment de l'année. Il s'agit là d'une belle occasion d'entreprendre un projet de partage de ressources, de commanditer ou d'élaborer un cours de perfectionnement ou de mener des recherches dans le domaine des sciences de la santé.

La création du fonds de développement ne signifie pas pour autant la fin du prix commémoratif du 10^e anniversaire. Le prix sera encore offert tous les ans à un chapitre qui a terminé ou achève un projet. Le prix vise principalement à mettre en valeur les réalisations des chapitres.

Le groupe de travail sur les normes des bibliothèques dans les établissements

de santé accomplira d'autres tâches importantes pour l'association. L'ABSC/CHLA a toujours cherché à appuyer les bibliothèques des hôpitaux, et cet appui importe maintenant plus que jamais. Le groupe de travail travaillera étroitement avec le (la) représentant(e) de l'ABSC/CHLA au sein du Conseil d'agrément des établissements de santé (CCAES), en vue de démontrer de quelles manières, par la gestion des connaissances, les bibliothèques contribuent à l'amélioration de la qualité des services. Le groupe de travail s'inspirera des réalisations du groupe de travail précédent pour réviser les normes de 1989 des bibliothèques des hôpitaux. La composition du groupe de travail n'est pas encore établie, mais j'aurai le plaisir de vous annoncer les noms de ses membres dans le prochain numéro.

En tant que présidente cette année, l'un de mes objectifs consiste à communiquer personnellement avec chaque président(e) de chapitre. Il s'agit là d'une expérience enrichissante, car je peux m'informer directement des préoccupations au sein de chaque chapitre, et discuter des moyens de faire en sorte que notre organisme national puisse à la fois s'occuper des grandes questions et faciliter le développement à l'échelle locale. Au fil de mes discussions, je me rends compte bien sûr, et c'est là une réalité bien canadienne, que la communication à l'échelle du pays requiert beaucoup de temps et de ressources. Cependant, les bienfaits que nous en tirons en valent la peine et, de toute façon, de tels efforts ne sont que naturels pour nous, car nous occupons une profession dont les buts premiers sont la communication de renseignements et la constitution de partenariats. ■

Un Mot de la Présidente

Bev Brown

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Electronic Journals in the Health Sciences: the Present Landscape and the Horizon

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*Presented at the 1993
Canadian Health
Libraries Association
Conference in Banff,
Alberta*

The term "electronic publishing" does not define much except the making available of information through electronic means. It covers a range of services already well known to librarians directly or indirectly. There are the online services: databases like MEDLINE, informal communications known as "bulletin boards". There are texts and databases in CD-ROM formats and journals published in their usual paper formats but also available on CD-ROM disks such as those of the American Society for Microbiology. There are the bundles of journals made available in CD-ROM formats. There are multimedia systems like that being developed in the United States, the Pyramed program which uses a combination of the CD-ROM format, online transmission, and image capture from television transmission. There are "pocket databases" that can be consulted, for example, for drug information. None of these categories covers that part of electronic publishing that is just developing and which, because of the consequent uncertainties as to how it will develop, has the greatest interest to librarians: the electronic journal.

What can be said about how electronic journals in medicine will develop? There is already a large literature on what electronic publishing may imply for librarians, a literature that runs back to the years when not many of us saw a fast growth of electronic publishing just ahead(1). My judgments here come mainly from my experience with a pioneering effort in journal publication in an electronic medium and the reflections spurred by that work. I have been associated as editor with

The Online Journal of Current Clinical Trials being published by the American Association for the Advancement of Science (AAAS)(2). CCT, as those of us involved call it, has been available for a bit more than one year. The concept of this journal and its editorial aims, policies, and functions are the responsibility of the AAAS; the "publishing" (making the journal available online) is by OCLC in Dublin, Ohio. A second journal for nursing has been promised by OCLC for release late in 1993. Other electronic journals are ahead. One of the major basic medical science societies in the United States has indicated its intent to make its paper journals available in electronic versions within about three years. One of the major weekly journals covering all of science believes it will follow the same course in about the same time. Will these ventures succeed? How well? How quickly?

What is the Future for Electronic Journals?

Answers to these reasonable questions must be conjectures at this point. We have too little experience for confident judgments. But is there any way to try to guess what might be down the road when many electronic journals might become a part of medical literature demanding the attention of librarians?

In trying to answer these questions, we need some basic principles for a starting point, principles that seem reasonable and validated by past experience. I think there is a starting point, the equation I believe expresses the determinants of what kind of information in a particular format

gets used and by whom, and whether it becomes a major resource in any discipline that frequently needs information. This is the value-benefit-cost equation(3).

$$\text{Value} = \frac{\text{Benefit}}{\text{Cost}}$$

Benefit is the fitness of information for the task at hand, how well the information meets the needs of the person who sought it. I am not going to try to analyze the components of benefit, but to try to simplify the analysis of value (perceived worth) by assuming that most users of a particular medium (a journal, a book, a database) have a fair grasp in advance on whether it possibly or probably carries useful information. Cost is a complicated part of the equation. It is not just the purchase price (the subscription fee in usual terms). With electronic journals it may have to include the cost of getting a paper copy of the individual article. The subscription price is likely only to give the subscriber the access to seeing an individual article on the monitor screen of the receiving computer and not to include delivery of a paper copy. Another piece of the cost is the time needed for the subscriber to turn on the computer and look at whatever format represents its table of contents. What will be the portability of the electronic journal? Will the format for an article be such as to enable the subscriber to download what seems to be worth further attention and take it to the beach for reading? What will be the cost in time for the subscriber to learn how to make efficient use of the electronic journal? What of the would be subscriber who is computer-naïve, the cost in time and effort to find out what is

needed, to buy it, to learn how to run it?

A classic example of a new medium that failed to grow up to what was expected of it is the audio cassette. Back in the 50s some promoters of the audio cassette as an advance in conveying medical information thought it might supersede paper journals as the carrier of new information. The eventual place of audio cassettes was well below that expected. Audio cassettes were relatively cheap to produce, but were a very slow format for access to information needed for a specific problem. They found a place as sources of background information that could be tuned into during times when no other income generating activities were possible. The neurosurgeon driving down the express highway en route to the hospital cannot be operating on a patient in the adjacent front seat of the car, but the audio cassette can be pushed into the player and played out during otherwise useless time. The equation might have predicted the fate of the audio cassette. What can it tell us about the electronic journal?

The Value Equation and the Electronic Journal

The value-benefits-cost equation might seem only to be useful for predictions about how potential and actual subscribers will see the electronic journal. But remember that value, benefit and cost are concerns for producers and well as consumers. The equation can apply to authors' needs as well as to those of subscribers. What are the possible benefits of electronic journals to authors?

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Values for Authors: Benefits

Electronic journals will be able to make authors' articles available to subscribers far more rapidly than paper journals can. The fastest of present paper journals in getting accepted articles published, *The Lancet*, can get an article out in ten days, but most journals take far longer than this. Most press schedules take six to twelve weeks. When one adds the effect of the usual backlog of accepted articles to this time, the publication time, the wait of the accepted paper in the queue for scheduling plus the press time, it runs to three to six months for monthly, and even weekly, journals. An electronic journal will be able to publish accepted articles in 24 to 48 hours; some time will be needed between acceptance of an article and its publication in the online system for marking the manuscript for its formatted presentation on the monitor of the receiving computer. The peer reviewing time will, however, probably not be cut much; our experience so far with *CCT* is that peer reviewers take as much time in reviewing articles being considered for publication in an electronic journal as they do for a paper journal. Faxing them manuscripts saves a bit of time, but the usual human factors still play out as expected. Hence time will be gained for authors, the total time for the entire process from submission to publication probably running about half that with paper journals. This gain may not be seen as substantially valuable by some authors, but it will be by others, notably those in highly competitive fields.

A greater gain for more authors may be less constraint on the length of papers they can get published. The pressure from editors on authors to write shorter papers comes in part from the conviction that shorter, more tightly written papers are likely to be clearer and more easily read than long papers. But it also comes in part because most editors work within constraints on the number of pages they can publish per year; forcing authors to write more concise papers enables editors to publish more papers, thus usually serving the journal's interests by accommodating more authors and offering readers a wider range of content. Authors are sometimes frustrated and the needs of some readers are sometimes ignored by these constraints. Methods sections may not carry as much detail as other workers in the same field might wish to have. Subgroup analyses that could cater to the interests of some readers are scrapped to keep the paper's length within the journal's allowance. Electronic journals do not ship tons of paper and pay its postage. Hence they may be able to carry substantially longer papers that will still be readily navigable through the use of internal linkages, enabling the reader to move rapidly from one part of the paper to another.

One of the attractive aspects of the electronic journal is the hypertext function. This is the linkage between different documents that enables a reader of one document to jump rapidly to another. In the electronic journal, a paper published today might be the subject of adverse criticism in a letter to the editor five months later. The reader who

finds a research report in a paper journal that apparently meets his or her needs may not find out promptly that its conclusions were thrown into doubt, or even discredited, by the letter. The electronic journal, in contrast, can link the letter to the prior report so that when the reader opens the report a flashing signal indicates that some other document is related to it, in this case, the letter, which the reader may find worthwhile to consider. The hypertext linkage is just as valuable for a reader's movement in the reverse direction. If an editorial comments on some topic of current importance and cites relevant papers published earlier in the journal, the reader is able to jump back quickly for a look at the cited papers. This is, of course, a value for readers but it also means that an author's paper is likely to get more visibility in the future in the electronic journal than if it were in a paper journal.

Possible Costs for Authors

Some characteristics of electronic journals may seem disadvantageous to authors, at least in the near future. The available formats for monitor displays of tables are forcing authors to construct relatively small tables, especially confined in width. Hence large tables that could be accommodated readily in paper journals are likely to have to be reworked for the electronic format. This is not necessarily a disadvantage for readers; indeed, the reconsidering of table structure and size may at times lead to more sharply focussed tabular presentations.

At present, most systems for purely electronic journals published by on-

line transmission probably cannot carry illustrations with continuous gray-scale tones (the halftones representing photographs). Such images could be transmitted but, in general, at a high cost in transmission time. This limitation may drop away in the not too distant future when much higher speeds of transmission will be widely available.

Probably the main costs in the near future for authors putting papers into electronic journals will be the relatively small audiences and hence the relatively low visibility their papers will have. Authors publish in large part to get their names visible; the paper journal serves this function efficiently by putting the contents page on the front cover and delivering its issues to the desks of the passive subscribers who do not have to turn on a computer and make the additional exertions to look at electronic journals.

How long will these costs outweigh the benefits of the electronic journal?

Values for Readers: the Benefits

The benefits for authors are also likely to be benefits for readers. The speed of publication may not be especially valuable for most readers; the exception might be the occasional reader who has a clinical problem to deal with for which a quickly published, newly available paper may contain the valuable answer. The hypertext function is likely to be the greater benefit for most readers. It will enable the reader to jump quickly to a number of relevant documents that would otherwise take a substantial cost in time to find and

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look at. One of the present hypertext links of this kind in CCT is that to a MEDLINE file. The references in CCT to papers indexed in MEDLINE through the past five years carry indicators that the MEDLINE entry for the referenced paper is available. A click on the indicator delivers the MEDLINE entry, including the abstract, to the screen.

Costs for Readers

In introducing the value-benefit-cost equation, I commented briefly on how the cost for a journal may include much more than just the subscription price. Paper journals serve passive recipients quite efficiently. The journal goes into the mail, it arrives in the mail of the subscriber, and it goes onto the subscriber's desk for immediate or postponed scanning. With an electronic journal, at least now, the subscriber may have to buy a computer and learn how to run it, or get an aide to take on these tasks. Someone has to turn on the computer; then the subscriber has to sit and look at the monitor for a decision on what to pursue further, get someone to download a contents page or papers with subjects of specified topics, or order paper copies of those papers. The time for scanning papers at the monitor may seem relatively long compared to scanning in paper journals. Last, and not necessarily least, is the lack of portability of the journal. At present, one cannot readily take the computer to the poolside for a browse.

Additional Uncertainties

Analyzing the benefits and costs for readers of electronic journals is fur-

ther complicated by the generally differing needs of readers who are researchers and those who are practitioners(4). The electronic journal is likely to be more attractive to readers in research. Their needs are usually met by the availability of individual research reports on their specific interest: what are my competitors doing; what new methods may be advantageous for my work. The practitioner usually needs synoptic information: what treatments are available for my patient's problem; what is the sum of experience with a treatment, the benefits, the risks as judged from more than one trial. This has been the practitioner's need for centuries, hence the perceived value of textbooks, lectures, postgraduate courses and other sources, including one's immediate colleagues, of presumably reliable synoptic information. Because electronic journals are probably going to make their way for some time to come mainly through publishing individual reports of research, they are likely to be seen as valuable more by researchers than practitioners.

Probable Evolutions of Electronic Journals

From this analysis of probable benefits and costs for electronic journals for authors and for readers can come some guesses as to how electronic journals will evolve. Note the "will evolve". There is already enough experience with electronic communication in the sciences through bulletin boards and database access to make clear that electronic publishing is coming and will probably grow fast within the next three to five years. Some

prophets conclude that rapid electronic communication may make journals archaic(5). I think that guess is wrong, at least for publication of formal research reports. A central value in scientific publishing has been the scientific paper that commits the author to stating the specific question tackled, describing the methods used to find an answer, setting forth the relevant data found, and providing a definite, final answer conclusion. All of this information is needed by persons who wish to judge the reliability of the reported work and its answer, both immediately and in the future. This is the main function of the journal, and I think it will continue to be needed in some type of journal, no matter its format, be it paper, computer storage, or CD-ROM disks.

Pre-paper Publication

If the visibility of one's paper is the leading value for authors in publishing, then they will probably be more attracted to a system that combines speed of publication (present value) with high visibility (also a present value). Hence, I see the main line of development for some years to come as a shift of paper journals to a mix of both media: papers will be made available in an online system as soon as they are ready for publication and they will appear later in the paper journal. Readers who need papers quickly will be willing to pay some additional cost to get what they want; readers without highly specific and urgent needs will wait to get the bundle of papers called a journal several weeks or months later.

Splits of Paper Journals: Up Front on Paper; the Back End, Electronic

A further and likely variation on that kind of system will be the shift of journals most valuable for their synoptic view of what is going on to a format that will satisfy a high fraction of their readers at a lower cost. These are journals like the weeklies *Nature* and *Science*. Most of their readers spend most of their time, I would wager, on reading or scanning their front ends. These are the pages with the commentary on current issues in science, political and economic as well as conceptual, and with synopses of current lines of research and its recent findings. The papers in the back half, the research reports, are getting to be so arcane as to have steadily shrinking numbers of real readers. So the present front end will become the real body of the journal and the present back end will represent the reports made available online only by abstracts.

Archival Journals: All Electronic

Many scientific journals are mostly unread and serve mainly an archival function. Typical of this group is the *Journal of Clinical Investigation*. It is an important, valuable journal with high prestige. But who reads it in the sense that most subscribers to *Nature* and *Science* read them? Another example is the *Proceedings of the National Academy of Sciences*. It publishes a huge number of papers drawn from all the sciences, most of the papers of substantial importance. Who can read any of them? Only relatively small audien-

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ces per paper. Hence why ship out such journals as tons and tons of paper when only small fractions of them are ever consulted by particular audiences? Journals of this kind are likely to shift in time entirely to the electronic medium, perhaps after a transitional period, with dual publication in the electronic and paper media that will end when electronic transmission and access are cheaper and technically more capable of reproducing complex equations and other aspects of scientific notation not readily transmitted now.

Mixed Media

Electronic journals will become more attractive to readers when less effort is needed to access them. One possible solution would be the transmission of single papers, or of periodically issued groups of papers, ie. issues, to computers left constantly turned on or that could be turned on by a remote signal to receive the transmissions. The papers would go onto the computer's hard disk and be available for scanning without the prior effort needed with present electronic journals. Such a system could include a connected CD-ROM with MEDLINE files; the journal software in the computer could access the CD-ROM for a search for requested abstracts of referenced articles.

In systems like this, the number of papers accumulated in time could become very large. The indexing and retrieval system will have to be highly efficient if the advantages of such a cumulative journal, the electronic equivalent of bound volumes, are to be realized. Such a system supplying a single journal

would probably not be attractive to subscribers with wide interests, but it could be highly desirable for subscribers with relatively narrow and sharply focussed interests likely to be satisfied most of the time by only one or two or three journals.

The Need for Technical Advances

These speculations already suggest technical improvements that may be necessary for rapid growth of electronic journals. Much higher rates of transmission will be needed for inclusion of detailed images. Some kinds of resident software might enable the receiving computer to build equations and other complex presentation such as tables more efficiently for display within papers. Means will have to be found to give readers more felicitous ways of viewing journals' contents, with features like departmental groupings of types of papers (research reports, review, editorials, and so on) akin to the present contents page of paper journals.

What are the Implications for Librarians?

By now it should be clear that with the growth of electronic publishing librarians may take on even more critically needed functions than they do now. Some habits of concept may have to be discarded. What, for example, if electronic journals issue papers individually as they are ready to be published rather than sent out in the bundles we now call issues? The present issues of paper journals are simply economical ways of bundling papers for lower transport

costs. What will happen to the accession of issues? And if individual issues with separate contents pages are not made available periodically, will librarians be asked to monitor online journals and periodically produce contents pages for dissemination on paper or via an electronic network to their patrons? Will librarians have to become retailers of individual articles, perhaps either acquiring copies of papers on request for a fee or developing inventories of recently published papers?

The implications for librarians may depend at least in part on how rapidly electronic journals acquire individual, personal subscribers or whether libraries will be the chief subscribers and will have to serve as a kind of local agent for the journal. The evolution to either system will also depend on whether the main use of online distribution will be by well established paper journals that begin to offer prejournal releases of papers in advance of the issuance of the paper edition. This evolution will probably spur individual subscribers to shift to online access and leave the acquisition of the paper edition to the library for archival needs.

A further line of evolution may be eventual abandonment of paper editions. The publishing of papers would be entirely through online access; the archival edition would be in the CD-ROM format. This would be a much more attractive system for

individuals who could turn on their computers from time to time to see what is new (or have their aides do that), download the occasional paper they really wish to get in their hands rapidly, and rely on the library's having the CD-ROM archival version for access to previously published (online) papers.

Where Are We Today?

The publishing of electronic journals is just beginning. We stand with it about where we were with automobiles in 1905: unstandardized systems, relatively expensive hardware, a few good roads but many unmapped muddy lanes. How we move along is going to depend in part on how intelligently electronic journals are planned to take into account real needs and how the costs of various systems come to compare with conventional paper publishing. Electronic journals have the potential to be much cheaper to publish than journals on paper with mail distribution, but the startup costs are substantial and the relatively small initial audiences will for some time keep the distribution costs per article relatively high.

We are all in for a fascinating, sometimes confusing and exasperating time in the years right ahead, as the forces that shape publishing — needs, satisfactions, costs, and technical gains — play out against and with each other. ■

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Harnessing the Whirlwind: Information Technologies in the Service of Aesculapius

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Introduction

It is a special pleasure to be able to return to the Canadian Health Libraries Association in these beautiful surroundings and in this, the seventeenth year of CHLA's existence as a formally constituted association.

As I accept my commission as a speaker, I stand mindful of the dictum of John Kenneth Galbraith that "in our culture, speeches are the vacuum that fills the vacuum."

As you would gather from the introduction, I no longer practice as a librarian. Some might say I never did and that my greatest contribution to the profession, or at least to health librarianship, was to leave it. These friends aside, I still consider myself a librarian and regularly allow its principles to influence my wider duties.

You will also note from the introduction that I have had the unique good fortune to have served as both a Law Librarian and a Health Sciences Librarian, while at Dalhousie University in Halifax. I never cease to be amazed at the range of similarities between these professions which on the surface seem to have so little in common.

In any event, in an interesting coincidence, at about the same time that I was invited to speak to the CHLA, I was also invited to keynote the Canadian Association of Law Libraries Conference in Halifax three weeks ago.

In both cases, when asked to speak I felt both honoured and insulted. Honoured because I hold both CHLA and CALL in high regard.

Insulted because these were the first times that I have ever been asked to speak from the perspective of one of the "old hands".

I have long relished the role of the young upstart seeking to do things in new ways with better tools, to point the way to exciting futures that advance our cause. I took to heart an admonition I once heard from Joey Smallwood who said "if you are not a flaming radical at 20 what a dirty, stinking Tory you'll be at 50."

In truth, the requests were not unreasonable. While I am just 50, well at least my knees are, I have been working in, or probably more accurately, employed in academic libraries in Canada for nearly thirty years. Early in my career I became involved in the "special library" function on a campus, first as Government Documents Librarian, then as Law Librarian and finally in 1972, on very short notice, I received, as they say "the call" to serve as a Health Sciences Librarian, which I did for nearly seven years. While these may indeed sound like the confessions of an old fart, I assure you that my focus is still on a future that remains as exciting and challenging as ever.

Today, I have been asked to focus on new technologies, their impact on the health library and some strategies for coping with change. Much that will affect us is beyond the confines of our particular disciplines. In addition, with so many threats and challenges facing us as librarians in any variety of organizations, I believe we no longer have the luxury of simply choosing among the smorgasbord of interesting technologies as we chug along

doing those things we have always done.

For this reason I entitled my remarks "Harnessing the Whirlwind" to reflect the exciting and continuing instability that surrounds us and that paradoxically challenges us at the same time as it reinforces the basic philosophy of those who serve in library and information spheres.

For several reasons I am inclined in so doing to look into the past and as well as into the future and, through this strange binary, incite you in the present to shun any dreams of simply being spectators to the information parade, for it will only be the marchers who will be able to maintain the pace of change.

History

As I commence to reminisce as one of the dead hands of the past, I remind us of the view that "nostalgia ain't what it used to be".

Seriously, I believe some consideration of our history helps us to find perspective and to do what history tells us to do – to learn from our past and in it, to find elements of our future. In so doing, let us set context and recognize and honour "those few, those happy few, that band of brothers and sisters" who built our profession in Canada.

Last month, it was my pleasure to present Mr. John Ballem for an honorary degree. You probably don't know him, but Mr. Ballem is a successful Calgary lawyer and author of a landmark legal treatise who has also authored a long series of pulp novels.

In his address to these new practitioners, he reminded them that they would practise the bulk of their careers not in the 20th century but in the 21st. That they would be expected to practise not by 20th century standards but by those of a new century, which they will be expected to develop.

This is not simply an academic consideration, as most of us will travel with them for at least part of their journey. As we make that journey, we should carry the main lesson of our history, that change is a constant and innovation and adaptation are the key tools of leadership and even competent survival.

Medical Libraries

Medical libraries have been on the scene in Canada for many decades with some medical school and hospital libraries tracing their roots back several generations. The modern era really dates from the late fifties or early sixties when there was a confluence of many revolutionary changes in the health and education systems of this country.

I refer to the introduction of universal hospital insurance and then universal medical care insurance. These occurred in an intertwined manner with the phenomenal intervention, after decades of neglect, of the federal and provincial governments in the funding of universities with particular interest in the expansion of education for medicine and the other health professions.

The 1960s saw the expansion of medical schools and their medical libraries in the larger context of the

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expansion of universities and all of their libraries. The creation of four totally new medical schools also provided great impetus for the expansion and redefinition of medical education and medical libraries as the new pioneers sought to redefine their environments without the burdens of tradition that challenged existing schools, which were also significantly expanded.

Concerns for health care and local economic well being also led to significant expansions and upgrading of hospitals in hundreds of communities throughout the country. A few were even convinced to make provision for libraries. The lesson here is that in most instances the key decisions concerning the fundamental nature of health libraries including their very existence are usually totally dependent on persons beyond the library, some directly affected, others barely affected.

It was in this era that the role of the professionally trained librarian came into its own and many significant librarians flourished as we witnessed the first real recognition in Canada of the role of medical libraries and medical librarians in a successful paradigm of medical education and practice.

This was followed by increasing recognition in many universities and organizations of the integrated nature of information for all of those in the health professions such as nursing, physiotherapy, nutrition and pharmacy among others.

While there was much lip service given to the concept of the health team, it was still very much physician centred. It was the pattern

in some universities that the first locus of real recognition of the integrated nature of the health sciences came in the libraries as barriers between doctors' information and nurses' information were dismantled, often at the instigation of librarians.

The 1990s seem fated to be marked by the reversal of some of these trends as the economics of our health system and the cumulative fiscal result of the building of our systems cause those who govern and those who pay for the process to retreat from some of the existing models of service and seek alternatives that maintain health and care in an affordable environment. Part of the problem has been the increase in technological interventions. Conversely part of the solution is to be found in the interventions of technology, particularly information technology.

When I entered the health libraries field in 1972, it was characterized primarily by the people and collections in medical school libraries. The strength of service depended on technology providing little beyond photocopiers, automatic typewriters and mainframe produced serial lists. Some health libraries were equipped with telex machines for interlibrary loan purposes.

The leadership of health libraries ranged from the innovative and visionary to the eccentric to the faithful handmaidens of the physician. Organizational focus was on the Medical Library Association for those who could afford it and on the Medical Librarian's Group within the Association of Canadian Medical Colleges, the ACMC.

There was a small and ineffective health libraries section within one division of the Canadian Library Association. I suspect the whole health libraries work force in Canada could have fitted into this room.

Many of the names that come to mind will be unknown to many of you, but to the survivors of the era each conjures up images and attitudes that reflect the roots of the profession: Doreen Fraser (Dalhousie), Anna Leith (UBC), Andras Kirchner (Laval & Calgary), Audrey Kerr (Manitoba), Dick Fredericksen (Memorial), June Huntley (NSL/HSRC), Martha Stone (Health & Welfare), Beatrix Romanow (McMaster), Phyllis Russell (Alberta), Sheila Swanson (Toronto Academy of Medicine), Bill Fraser (BCMedical Library Service). I'll stop there even though I know I have slighted others worthy of mention particularly some who still labour in the vineyard.

It was from this group that came CHLA, the strong interest of CISTI in health libraries, the rapid expansion of Medline in Canada, the bilateral relationship with MLA, the introduction of significant audio-visual resources into libraries and a well established philosophy of cooperation.

(As an aside, I am distressed but not surprised to hear of the demise of HSRC. As one of its early members I urge CHLA in whatever response that you make to do everything you can to retain the formality of access that was provided by the HSRC Advisory Committee even if CISTI or NRC fund none of it. It is an open door and one should always resist the closing of open doors.)

In the period of the 1970s there was a significant chasm between the information we held in libraries and the information used by the clinicians in patient care. We held the generic information and the written record of the experience and discoveries of the professions. Hospitals held patient-related data and housed the apprenticeship system of learning. I sensed widespread acknowledgement of the value of library-based information but in reality many clinicians had little time for it beyond lip-service.

In my opinion it was curricular reform and a technology that started the convergence that we see today. Curricular reform moved medical schools away from the concept of term length courses into the systems approach to teaching. Without commenting on the methodology, this approach broke down many of the barriers between disciplines and helped break down barriers between students and those of us who served them. The current wave of curricular reform is carrying on this new tradition.

Possibly even more important for us was the introduction of Medline into Canada in 1973, through the good offices of CISTI. We have never looked back for it brought a far more fundamental change to the world of medical information than I think we even realized at the time. It was a true change. In addition to allowing us to do things faster, i.e. search indexes, it allowed us to do things differently, to take a three dimensional or even four dimensional view of the information base of medicine. Even without full text searching we were given access to

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information in a way that was accessible only to serendipitous discovery previously.

New Technologies

Taking that as a starting point, I will suggest it is a given that new technologies will continue to evolve to address innumerable problems in all aspects of life including the many facets of health care and health care education. While the usual litany of new technological toys is always fun, I would like to spend some of my time in what I hope is productive generalization.

Let me ask each of you to cast your mind back five or ten years to look at the technologies you and your clients were using in your work. Compare it to what you are using today or know that you could be using. I assume there is a significant difference.

At the very least, you can assume an increased rate of change in the next five years but that is very, very conservative. As with the introduction of Medline, we must come to realize that technological change will not simply be doing the same things faster or cheaper. Technological change will mean doing most things very, very differently.

Two things seem particularly germane.

One is the move in most parts of society to give individual workers at all levels, from the board room to the shop floor, the tools for greater independent activity and productivity anywhere, anytime. To free them, wherever possible, from the need for

complicated interactions with intermediaries, such as us!

Another move is the use of technology wherever possible to foster deskilling of tasks, to have work competently performed at the lowest cost possible whether handled by people or by machines.

Parallel to this cascade of changes in the approach to work is the ongoing reform of organizational structures. Reform seeks simultaneously to:

1. achieve maximum competent throughput within an organization,
2. minimize levels of administration, management and housekeeping, and
3. bring the organizational decision makers and the patient or student as close together as possible.

In libraries, in our most important tasks, we are almost always intermediaries. In libraries we have a significant recent history of deskilling. In many of our library organizations, many of the tasks we perform can be characterized as administration, management and housekeeping.

I believe our ultimate goal is to organize the services to clients so that much of our current efforts:

- 1) will be unnecessary, or,
- 2) will be in the background, or,
- 3) will be in the sophisticated training of users to be effective in the use of self-mediated services, or,
- 4) will be in providing value added services to supplement an evolving self-help environment.

I expect us also to become the infrastructure people in many of our organizations. The traditions of those who have been providing infrastructure in the past, those in computing, media, telecommunications, other technological services, has been to focus on the tools and processes much more than the content and context of their use.

By broadening ourselves best to apply our content and context skills, I believe librarians can become important players in the evolution of our organizations. If we do not, we risk irrelevance.

The hardware technologies that will be important to us will be those that provide:

- 1) individual workstation storage in the multi-gigabyte range,
- 2) memory capacity with capacity of significant fractions of a gigabyte and the capability to handle much larger files and more complex software,
- 3) processor speeds well in excess of contemporary equipment.

These are inevitable. I read recently that Intel has appointed the leader for the 786 development team just as the Pentium or 586 chip was about to enter the marketplace. The 686 is already well down the pipeline.

Software will move well beyond the productivity tools with which we are familiar to intelligent software that will allow the practitioner to manipulate situations of greater complexity, drawing on diverse databases of information and experience that will be significant mul-

tiples larger than those currently in use on the desk top.

Proprietary communications networks will disappear from our hospitals to be replaced in the first instance with generic high speed networks based upon fibre optics and significantly improved use of the installed bases of copper telecommunications wiring. Witness the recent announcement of Super Ethernet designed to get 100 megabit speeds from existing wiring, up from ten.

Communications will move away from wires to a wireless and therefore more portable environment, in spite of the particular challenges this will offer in hospitals. Availability of higher band widths at lower costs will allow easier access to masses of information from multiple sites. Communications will take place on scalable bandwidth networks with near universal yet secure access along the lines currently enjoyed by those able to use the Internet.

Network use will be facilitated by sophisticated successors to the Internet utilities such as *Gopher*, *Archie* and *Veronica*, which will allow any user to identify appropriate sources of needed information quickly and independently and to arrange for its delivery to the desk top from anywhere, whether it be stored somewhere in electronic, paper or microform. The launch of the CANARIE project in Ottawa next Monday augers well for the future and the availability of expanded bandwidth to health and academic activities.

Network capability will significantly reduce the disadvantages faced by

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rural practitioners and facilities both for acquiring information and for gaining access to analytical specialties such as diagnostic imaging.

Standard protocols will convert the requested information or item into the format preferred by the recipient and will conclude any financial transactions in the background using protocols of electronic data interchange (EDI) and electronic funds transfer (EFT).

Standard protocols will also allow the user to lodge a request to receive automatically any changes or updates to their information for any specified period and to be informed automatically when such updates occur.

Finally, the desktop workstation and lightweight personal devices can be expected to converge in a way that will allow the most sophisticated desktop services to travel anywhere and to be continuously updated automatically. The bedside handheld device for recording, manipulating and transmitting information will become as ubiquitous as the stethoscope and paper chart.

Specific technologies likely to be available in the armamentarium of your organization will include voice based systems capable of doing all that a keyboard based system can plus manage and project sounds and images, both still and moving.

Such technology will be the key to breaking the barrier of keyboard resistance among many professionals, particularly physicians, whose oral traditions have seriously impaired the ability of many to exploit keyboard based technologies,

at least in the frenzy of activities in the hospital setting.

These are generic statements of likely technological change. Let us consider some of the new opportunities we can expect in health related information technologies and the look of libraries.

Health care is drowning in a sea of paper. A significant amount of that paper is computer produced. Paper is the enemy.

Based on projections by those in the informatics industry, we can expect significant movement toward the truly electronic patient record over the next five years. I would define the electronic patient record as one that will dynamically record, archive, index and present data generated by physicians and other care givers by voice, keyboard, sensor, imaging device and hand writing on digital devices.

Paper outputs will be available on a demand output basis but will not form part of the actual patient record. Input and retrieval will be handled through portable devices that will be secure and effective within ranges similar to the cellular telephone, thus linking the bedside, unit, administration, clinic, laboratory, practitioner's office, pharmacy, government, researcher and all other players in the patient care process on a need-to-know basis from a common information resource that is patient centred.

Province wide databases of a generic nature will be built largely automatically as a byproduct of the EDI transfer of billing, population and other statistical data. Subject to obvious privacy controls the

database will largely be open to all users, putting an end to the constant requests from all manner of agencies for statistical information.

Wireless communication from sensors and hand held devices will have the potential of putting administrative and systems matters in the background where they belong. Both wireless communication and communication over band width on demand will allow remote consultations via videoconferencing and will allow transmission of diagnostic images, sounds, patient records, sensor data and voice.

As an aside, I note that at the recent Indianapolis 500 auto race, most of the cars were equipped with multiple sensors that recorded all matter of performance data that was sent by telemetry to receivers in the pits of each competing team where the data was recorded and analyzed on notebook PCs both for immediate decision making and for archival purposes and detailed post-race analysis. If it can be done for automobiles we should be able to do it for people.

If the ferocious dragon that is the patient record can be brought under control, certainly the other significant information challenges can be addressed. I see these as being:

1. successful management of generic information, and
2. effective education and training.

The handling of these issues will have a very significant impact on the agency we know and love, the health sciences library.

Health Libraries and Information

While the most obvious physical manifestation of our libraries is our collections, if we were asked to characterize libraries in one phrase, it would be: retrieval of information. At the moment, the support of retrieval requires activities of acquisition, processing, housing, preservation, reference and circulation, among many others. Most of these activities are elements of housekeeping necessitated by the current artifacts of information: books, journals, media, microforms, etc. As the artifacts of storage change, so must we.

It is clear, without a doubt, that the rising artifacts of storage are electronic. Whether held locally in the form of videotapes, laserdisk, CD-ROMs or hard drives or drawn from network sources.

You have heard earlier this week about the slow and painful issue of the electronic journal. I would suggest that its acceptance depends much less upon its technical evolution as it does upon political, economic and social factors as it seeks to achieve affordable acceptance within the primordial soup of peer evaluation.

There are incentives. With economic concentration in the STM fields in particular, our libraries are slowly being devoured by increasing serial costs: paying more for less. Our current scholarly communication system of choice generates costs at every turn: production, printing, paper, postage and profit. In an electronic environment, none of these needs to be

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present as long as the integrity of the peer review systems continues to thrive.

The late Captain Robert Maxwell of Pergamon used literally to chortle about his money spinning machine that gave him his journals' content and credibility almost without any cost whatsoever and then gave him substantial advance income from subscription prices, all with little complaint up to several years ago.

It is no wonder this industry produces 20-25% return on investment. No wonder that the sale of 400 or so Pergamon titles to Elsevier produced an average of US\$2 million per title.

This is not, however, just a simple case of predator and victim. No where is that more obvious than in our current system of academic advancement which is anchored on success of academics in scholarly publishing.

The process of academic advancement, the promotion system, is a most important player in the dysfunction of our current regime of scholarly communication. We are now perishing through publishing.

This is not a library problem. We in the academy are the problem. We generate the new knowledge largely at public expense. We generate the demand for outlets in order to record and share our insights. We give it away, usually to commercial outlets. We then must buy back the results of our labours in the form of publications, primarily journals. An electronic environment that moves us back to a scholar controlled process of free standing, peer reviewed individual papers, or more

accurately, publications, may be a significant part of the solution. If progress were to be made on this front we might just see light and not a train at the end of the tunnel. The alternative is strangulation of the world of scientific scholarship.

While the concept of the journal is changing so also is the concept of the book, as multimedia technologies are applied to the creation of free standing works of information that combine text, images, animation, sound, graphics, and motion in dynamic works to produce informative results that are appropriate to the query of the moment. Medical education is one of the areas at the forefront of this technology with many medical schools embarking on such ventures, although not, it seems, in a systematic or coordinated approach.

As of February, all Macintosh computers will come with a CD-ROM drive or slot. IBM is expected to make a similar announcement this month, which will greatly increase the ubiquity of CD-ROM. At the same time laser disk players are now available in a cost range not dissimilar to those of the VCR.

I would comment that I do not see the CD-ROM having a long life as the prime localized mode of storing and retrieving large amounts of data. The rapid decline in onboard disk capacity seems to presage the relegation of CD-ROM to the role of cheap method of physical transport.

I have already referred to dynamic reference sources and the potential of automatic updating via the network. I anticipate information users will also have ready access to user

based plain language searching of large, multi-jurisdictional and multilingual full-text databases with automatic translation in both directions.

Watch carefully the evolution of dynamic information sources such as geographical information systems. These gather and blend relevant information from many sources to address a single non-repeated transient information product. Their applicability to medical information is self-evident.

As a final comment on library futures, I believe that more and more of our housekeeping, processing, cataloguing and the like will move off site to third parties evolving from the current book wholesalers who will not only broker access to published sources in all formats but will deliver them shelf ready and will update our local and co-operative bibliographic databases without our direct intervention.

Thirty years ago, Arthur Clarke, the great writer of fact and fiction and the original thinker behind the communications satellite, warned that "any sufficiently advanced technology is indistinguishable from magic." We must not be misled by the magic or by the magicians.

While these tools can assist pursuit of access and quality offerings, they are not a panacea. They are only tools. However, they can offer a catalytic impetus to new and different ways of addressing problems.

Similarly, Marshal McLuhan supposedly said the book was dead. We know that because he wrote thirteen of them. The book is not dead, but he is, even though his life's work

continues to live on in books and periodicals. Do not count the book out.

Effective Education and Training

A significant survival role for those who understand information will be the training and education of others to give them the skills of independence and self-sufficiency and to give them the opportunity to maintain those skills in the face of constant change. Arthur C. Clarke recently commented that "it has been rightly said that the best classroom consists of a log with a teacher at one end and a student at the other".

There is now a great shortage of teachers, not to mention logs, so we need to multiply their effectiveness in every way we can.

There are already hundreds of examples of effective application of technologies to the teaching-learning continuum. Almost all disciplines are represented. What is changing is the measure of success for such efforts. Cost-effectiveness shares the assessor's list along with pedagogical effectiveness.

Packaged computer based solutions are increasingly available. Acceptable packages must:

- be pedagogically effective,
- be integratable into curriculum,
- make frugal use of time and resources,
- operate independent of supervision,
- function independently within large groups,

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- operate on standard systems, and
- be generalizable to other institutions.

The CAI or CAL package that was a one-off labour of love requiring a mainframe and 150 hours of preparation for each hour of instruction is a luxury we cannot and need not pursue.

Moving beyond rote drill and practice systems, there are numerous opportunities to use simulation based learning environments that provide students with the safe, individual interactive challenges they need. Libraries, or more accurately, librarians can have a role in this evolution.

In the wings is virtual reality, which is on the verge of becoming a viable tool for simulation whether it is for teaching the complexities of equipment or allowing the experience of invasive surgery without a patient or the detail of molecular chemistry from within the molecule.

Nothing is better than the face to face contact and interaction across the log. The technologies can maximize that contact by shifting other aspects of the instruction and learning processes to the machine environment.

The response in our institutions is quite varied. Many have embraced this change enthusiastically. Some have not yet been convinced about its applicability to their areas. Others continue to eschew the technological route, almost taking what one scholar called his pride of ignorance. Such pride goeth before a fall.

One caution. Change and expectation work hand in hand. A change in the available media of information will result in higher expectations of the efficiency and effectiveness of those media. As with any good teaching, those exposed to media used appropriately will want more. The technological environment itself generates comfort with and expectations for continuous change.

Cost and Timing

We can also expect a cost regime that is specifically higher than the existing situation but which will be significantly lower at a unit cost level, as we move away from anticipatory resources and standby people services and see their replacement by just in time and highly customized services.

We can expect significant changes in the structure of our specialized publishers as some fail to make the transition and many new players seek to obtain a portion of the medical market.

Irrespective of which technological tools become reality and in what order, I have little reluctance to predict that the amount of change in the health care system and in its support mechanisms that will take place in the next five years will significantly exceed the cumulative impact of such changes in the last twenty years! This will be particularly true if the Clinton administration succeeds with its mission of health care reform, as 20-25% of the problem is deemed to be problems in informatics and paperwork management.

Most particularly we can expect the library to become much less a place and much more an agent of information through its skilled people and framework of technology. As a caveat to that I would suggest that one service that the library as place may continue to offer is to be a place of tranquillity and often anonymity: where the user can go to retrieve, study, write or think in isolation from colleagues, telephones and other forms of interruption. In the electronic world of information we may see new value in our medieval traditions.

Change and the Duty to Change

While some of these prospects will give us pause, libraries have a good track rate in dealing with technological change, less so than with some other kinds of change. Rarely have libraries developed technology for themselves. However, there are numerous cases of our adaptation of inventions and innovations made by others for other fields of endeavour.

Stereotypes, myths, preconceptions, misconceptions and self-conceptions notwithstanding, few other professions have excelled at adaptation, in synthesis and in technological exploitation as well as the profession of librarianship.

Aldous Huxley suggested that most humans dislike and even dread notions with which they are not familiar. Fortunately, it appears to be in the particular make-up of many of us who find our challenges in libraries to find comfort and inspiration in such unfamiliar notions.

One of the most difficult skills in mastering change is to see in ways that we have not seen before, even though that which we view is not itself changed. In a recent book, *Mathematics and the Unexpected*, the author, Evar Ekeland, described the phenomenon in the context of Copernicus, Kepler and the evolution of solar centricity in astronomy. He notes that:

... Copernicus, and all astronomers up to the time of Kepler, did not see the problem as it was: they saw it through the eyes of their predecessors. The circle, and circular motion, were too firmly ingrained in their minds by years of training, and had shown themselves to be too successful in the past. There was no room left for any alternative.

The question was no longer how to describe planetary movements, using whatever mathematical tools were available, but rather how to approximate planetary movements by sophisticated combinations of circular motions. By setting the problem in this way, the astronomers were unwittingly depriving themselves of any possibility of finding its true solution, the elliptical orbit.

They had drawn a magic circle around themselves, and were searching inside the circle for something that simply wasn't there. Kepler's genius was to break the circle, reach for available tools that were lying around unused, and look in the right place.

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In our age, we do not have the luxury of blaming the dominance and ignorance of our predecessor generation for that which is wrong and seeking only once in our lives to put something right. In the oft-quoted words of that great health librarian, Pogo, "*we have seen the enemy and they is us!*"

For those who might like to turn their backs or deny the necessity of change, I would like to repeat an 1828 quote from the British First Lord of the Admiralty that I have posted on my office door:

Their Lordships feel it their bounden duty upon national and professional grounds to discourage to the utmost of their ability the employment of steam vessels as they consider the introduction of steam is calculated to strike a fatal blow at the naval supremacy of the Empire.

We do not have the luxury of puddling along just to pass the profession and its environment on to our successors. The elements of change are so prevalent and the rate of their change such that by not acting to change continuously we will repudiate our duty to maintain competence. Therefore, much in the legal sense of the word, we have a duty to change. It is a duty that can never be fully discharged.

With failure as the only outcome of passivity and just going through the motions, it is therefore incumbent upon those who serve Aesculapius and the healing arts to craft new methods and new techniques to gain understanding of and access to the information that will meet those needs.

It will not be easy. Most of us work in large organizations that may not view themselves as information organizations. We must work around that even to the extent of productive subversion. I have always been a proponent of the view later expressed by that marvellous American, Admiral Grace Hopper, the inventor of COBOL, who counselled that it was always easier to apologize than to ask for permission. Our evolving world will not be without risk, but the taking of risk is becoming a normal part of our service imperative.

An essential part of servicing that duty to change is knowing what is going on, to know what the options are, to seek the high ground, to see what is ahead on the road and where the next forks in the road will be.

In preparing for today I compared the issues in health librarianship now and 17 years ago as represented in the articles in B.M.C. and the MLA Bulletin and on various Listservers. On the surface, they seem startlingly similar: sources of information, copyright, new technologies, serial cancellations, statistics, automation, certification, quality and so forth. In reality they are quite different in their breadth and complexity because the economic, political, social and technological contexts are so different.

While we can never easily know that which we do not know, this association and this conference are two of the keys to obtaining the knowledge of what is going on in the general and particular contexts. I hope you will continue to participate in your Association. Attend conferences. Challenge the speakers. Keep your

bozo detectors turned on. Only you have the responsibility for your own competence. The expectation of competence is a moving target. Only you can keep you moving along the road to competence. While colleagues will help and will be supportive, you cannot delegate this responsibility.

Let me return somewhat to my earlier parade analogy. The French Foreign Legion was never an organization to be particularly sensitive to change but it did know its mission and its duty. Its motto was an expression of pride and a threat: "*March or die!*"

Keep going or be left aside.

Our lives are not at stake in our march to information independence. Our careers and our professional integrity are. Either we are part of the solution or we will be discarded for being part of the problem. We will change or be changed. We can look at these challenges with fear filled eyes and a knot in our bellies or we can discover the pleasures of riding the whirlwind.

Let me conclude with a story to demonstrate that the challenges of change are so much in the eyes of the beholder. This story was told by a popular American business commentator, Harvey MacKay, who

lives in Minneapolis and had to get to a meeting in New York. His friend and mentor, Curt Carlson, an entrepreneur of legendary wealth, offered to fly him to New York in his private jet. Just prior to departure a ferocious blizzard blew in with such fury that the Minneapolis-St. Paul airport was closed for the first time in many years.

After several hours, the airport inexplicably provided a short grace period and opened a single runway for small aircraft only. While MacKay was beginning to think his meeting was not all that important, Carlson, who was piloting the jet, was not concerned and as luck would have it was the first to receive clearance to take-off. As they lined up at the end of the runway with their lights piercing the snow, Carlson turned to his passenger and said with great glee, "*look Harvey, no tracks in the snow!*" Carlson, successful beyond anyone's dreams, could still sparkle with excitement over being the first to make fresh tracks in newly fallen snow.

We must always be prepared to make fresh tracks or in the words of the theme: seek the peak performance. It may now be a duty, but if you try a bit every day, you'll love it! Thank you. ■

*Harnessing the Whirlwind:
Information Technologies in the
Service of Aesculapius*

(continued)

Social and Technical Dimensions of Electronic Journals

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Abstract

Publication in paper journals is still the major system supporting human knowledge processes. If computer-based systems are to have any significant long-term impact on human knowledge processes, the functions of the paper journal have to be subsumed and enhanced. To do so effectively requires deep understanding of the social processes underlying scholarly activities and publication, their support through the existing publication and library systems, and how that support can be emulated and enhanced through computer and communication technology.

Introduction

When we examine the growth of science and technology in general and that of information technology in particular, we see two exponential processes in competition with one another. As knowledge has grown, one of its byproducts has been the technology to manage the impact of the growth of that knowledge, but for a very long period it seems that the growth of raw knowledge has surpassed the growth of the knowledge of how to manage it.

The problems of matching these growth curves have long been recognized. For example, in 1937, just prior to the advent of computer technology, Wells was promoting the concept of a "world brain" based on a "permanent world encyclopaedia" as a social good through giving universal access to all human knowledge, and he remarks:

Our contemporary encyclopaedias are still in the coach-and-horses phase of development, rather than in the phase of the automobile and the aeroplane. Encyclopaedic enterprise has not kept pace with material progress. These observers realize that the modern facilities of transport, radio, photographic reproduction and so forth are rendering practicable a much more fully succinct and accessible assembly of facts and ideas. (Wells, 1938)

Wells' world brain concepts and objectives have continued for over fifty years to be an active theme in the information systems community (Goodman, 1987).

In 1939, Bernal echoed the same issues from the viewpoint of the scientist:

In the old ideal of science, communications were the only link between scientists. Now the very quantity of scientific information has made its diffusion an enormous problem, with which the existing machinery has utterly failed to cope. The present mode of scientific publication is predominantly through the 33,000 odd scientific journals. It is, as we have already shown, incredibly cumbersome and wasteful and is in danger of breaking down on account of expense. (Bernal, 1939)

Some six years later Bush was re-echoing these sentiments in his famous article in *Atlantic Monthly* which is often cited as the first expression of the need for hypertext:

Science has provided the swiftest communication between individuals; it has provided a record of ideas and enabled man to manipulate and to make extracts from that record so that knowledge evolves and endures throughout the life of a race rather than that of an individual. There is a growing mountain of research. But there is increased evidence that we are being bogged down today as specialization extends. Professionally, our methods of transmitting and reviewing the results of research are generations old and by now are totally inadequate for their purpose. (Bush, 1945)

We are acutely aware of scientific and technological progress in the last fifty years, and marvel at the continuing exponential trend lines in information technology that result in surprising new capabilities year by year, but surely these statements give the lie to such feelings. If H.G.Wells, John Bernal and Vannevar Bush presented these statements at a session of the American Society for Information Science today, would they not appear timely, significant and utterly to the point? The volume of scientific publication has soared since these remarks were made but the means of disseminating the information in those journals has remained unchanged, that of physically transmitting print on paper. There have been major advances in the technology of printing during this period, notably the development of low cost photolithographic printing, phototypesetting and computer typesetting, but the end product

remains basically the same as it was in 1665 when the Royal Society's *Philosophical Transactions* were first published.

Knowledge Dissemination

Journals are the major medium for discourse in the scholarly community and, as such, are intrinsically part of the social processes in that community. This section reviews the role of social processes in knowledge production, first from studies in the philosophy and sociology of science, and then more generally in terms of the function of feedback processes in efficient management of a society of cognitive agents. It emphasizes the significance of journals in ascribing priorities to intellectual innovations as part of a social reward system encouraging knowledge production. Because the material in journals has become detached from the activities, mental processes and existence of its originators, it may be seen as a record of those activities and external expression of those processes, available for the critical assessment of others independent of the originator. This gives rise to the 'objective knowledge' perspective on scholarly material, as products of human activity that are ultimately, in some sense independent of it, and autonomous in their own right (Popper, 1972).

Hence, one role of the journal is to act as a repository of knowledge and to make this widely available. This role involves the nature of knowledge, particularly as it is perceived by the client community who

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are not so much concerned with critical development of scholarship but with use of 'knowledge' as something that is reliable in application and whose sources can be trusted. The philosophical definitions of knowledge as "justified, true belief" provide a generative principle for the quality control that is applied to scholarly publication. The objective is *truth* but this arises from the expression of the *beliefs* of authors through arguments which *justify* those beliefs. The refereeing processes of current journals have been developed to apply standards of 'truth' and 'justification' to the material submitted, so that certain minimal levels can be relied on as applying to all material in those journals.

Justifications in the literature are generally not independent of one another but cross-reference other justifications to form a network of interdependent material. At a coarse level much of this structure is apparent through the citations between publications, and citation analysis provides a useful overview of the structures of scientific disciplines and their interrelations (Garfield, 1979; Bayer, Smart and McLaughlin, 1990). The formal structure of science as objective knowledge may also be modeled as a network of linked theories (Sneed, 1977; Balzer, Moulines and Sneed, 1986), whose dynamics of change may be modeled in terms of the underlying structural dependencies (Stegmüller, 1976) which are again reflected in the citation patterns in the literature.

This 'objective knowledge' perspective on journals, emphasizes

the significance of the product, its quality, and the technical linkages between items. There are complementary perspectives that see knowledge production and dissemination as a human social process, and emphasize the producers, their quality, and social linkages between them. Like all human discourse, the communications of scholars through journals serves many functions and carries many messages other than those overtly communicated. The review process that ensures material is of adequate quality has the side effect that the successful publication of material in a journal reflects well upon the authors: their statuses are enhanced by that of the journal in which their work is represented. In disciplines where scholarly research is dependent on access to limited resources, whose allocation is itself dependent on estimates of the status of the researchers, the journal publication process becomes part of the economic dynamics of the research program itself. The link between perceived capabilities and access to research resources significant in enhancing those capabilities is a positive feedback loop that gives rise to what has been termed the "Matthew effect" in science (Merton, 1968), that "unto every one who hath shall be given."

This analysis of the role of journals within the social processes of scholarship, and the interaction between the social processes and the production of knowledge, may be developed in detail through use of the literature on the development of knowledge. Feyerabend focuses on the anarchy of the origins of knowledge, that there are *no universal methods* underlying scholarship

and science (Feyerabend, 1975). Gellner emphasizes that our notions of 'justified' and 'true' derive from processes for the *legitimation of belief*, rather than *vice versa* (Gellner, 1974). This lack of absolutes in both the activities and value systems of scholarship may be seen as necessitating the establishment of the *paradigms* which provide criteria for rationality in particular disciplines over particular periods, and whose change Kuhn has identified with what are perceived as *scientific revolutions* (Kuhn, 1962). The definition of these paradigms is rarely overt, and they become identified with the social norms of cultures corresponding to sub-disciplines of scholarship that Crane has termed *invisible colleges* (Crane, 1972). The editorial and refereeing processes of journals associated with these invisible colleges support these cultures at the differing levels Hall has identified (Hall, 1959): at the *informal* level by providing examples that may be mimicked; at the *formal* level by accepting or rejecting material for publication; and at the *technical* level by publishing descriptions of the aims, objectives and methodologies of the sub-discipline.

The intricate involvement of journals in the processes and value systems of scholarship, and particularly the direct impact of journal publication on the allocation of resources to individual scholars, imply that the development of new technologies for scholarly communication is not solely a technical matter. They have to be designed to play an effective role within the social infrastructure of scholarship, and any changes and

extensions to the nature of the publication process have to be examined in relation to both that social structure and the underlying dynamics of knowledge itself.

Dimensions of Digital Journals

There are many different ways of attempting to improve scholarly communication using information technology. Widespread access to workstations and to the Internet are supporting experiments not only with electronic journals, but also with a wide range of computer and communication applications supporting scholarly discourse and knowledge representation. List servers and archives of reports accessible through ftp, gopher, WAIS and World-Wide Net are as important as electronic journals. We are seeing new patterns of scholarly activity emerge through use of the Internet, and these are exciting for their innovation but also problematic because they are not being professionally managed, and many aspects of scholarly publication such as archiving and universality of access are not being adequately addressed (Gaines, 1993).

One way of coming to terms with alternative approaches, their relative merits and roles in scholarship, is to classify them along major dimensions of variation.

D1. Private — Public: whether material is available only to restricted participants or generally available. Email is essentially private and most news groups are public, but many forms of semi-restricted access along this dimen-

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sion are possible. For public newsgroups an interesting subdimension is whether users are registered so that one can tell who has expressed interest, and a subdimension of such registration is whether one can tell which users are active recipients. That is, there are possibilities for instrumenting communities and measuring knowledge flows in ways that are much more difficult to achieve with paper-based media.

D2. Discursive — Archival: whether the service essentially supports discourse or the storage of materials, or both. Email and news are both generally discursive, whereas data repositories are archival. However, again many variations are possible along this dimension since some news groups are also archived, and archives with sequencing, for example through accession dates, can be used to support the type of "discourse" that is typical in journals where one article specifically comments on a previous one. An important subdimension here is the period of time over which material remains accessible. News is generally accessible for short periods, typically two weeks, unless archived, and archives generally maintain material for some years, but there is often no guarantee of this, and rarely a definite policy for the updating of versions of the "same" material.

D3. Moderated — unmoderated: whether material has to pass some checking process before being disseminated or is accepted without question. Email is unmoderated as are many news groups, but checking is also common to support groups

that wish to communicate information satisfying certain quality controls such as relevancy. There are many significant subdimensions here concerned with how, by whom and on what basis, the checking is done.

D4. Requested — Sent Automatically: whether material is sent only on request or transmitted automatically to an individual or group of users. Email is sent automatically but news, even though it is sent automatically to sites, is accessed only at the request of users. Archives generally only respond to requests, but mailing list servers send material through email to everyone registered with them. An important subdimension here is the visibility of material not sent automatically. News has a high visibility through specialist access programs designed to support browsing but remote archives may be totally invisible to someone who does not know of their existence. Some archives provide automatic notification of updates and good browsing facilities, while others provide minimal directories to compressed files with non-mnemonic names.

D5. Standard Format — Non-standard Format: whether the material is available in one of a number of well-defined and interchangeable formats. As already discussed, it is unreasonable to require a single standard format, but it is possible to operate with a range of formats that can be converted into a locally usable form.

D6. Accessible Content — Inaccessible Content: whether the full content of the material is available for search, indexing or reuse, or

whether only an image description is available.

D7. Multi-Media — Textual: whether the documentation representation supports fully typographic text, diagrams, pictures, sounds, video, and so on, or only text.

D8. Transient — Permanent: whether the material is available only for a period or indefinitely. Permanent availability is important to the "freezing" of a particular statement of knowledge to make it a well-defined subject of critical commentary.

D9. Mutable — Immutable: whether the material is fixed so that the apparent publication is not subject to change, or whether it can be edited without this being apparent except through content. This is again important to scholars having access to, and citing, precisely the same statements. Immutability does not imply that later versions of a document cannot be issued, only that these are treated as later descendants, not replacements.

D10. Authenticated — Unauthenticated: whether the material can be checked to be an authentic, unedited copy of the version issued. This ensures that immutability can be propagated to replicas of documents.

D11. Registered — Unregistered: whether the material has been registered with some independent authority to establish date of publication. To be useful this registration has to be of an authenticatable and hence immutable document.

D12. Indexed — Not Indexed: whether the material is indexed in

well-known, publicly accessible archives. This is important in supporting awareness of relevant material. The utility of the index may vary dependent on the amount of contextual and classificatory material entered, and on the quality of associated services, but some degree of minimal indexing is essential to the functions of a journal.

D13. Annotatable — Unitary: whether the material is structured in a way supporting precisely defined internal citation. Page and line numbers have never been very satisfactory but, at least, they were functional for paper documents. We need to establish new conventions for digital publications that can be supported by software. Uniform standards cannot be assumed, and the conventions will need to be fairly pragmatic for each form in which publications might be issued. This is very important to support peer commentary, conceptual and argument form annotation, and hypertext linkages.

D14. Attributed — Anonymous: whether the author of material is identified. This is primarily relevant to refereeing where referees are usually anonymous. There are a few publications that do not supply the identities of authors to referees, but this is not usually effective since they are often obvious and also the publication should be refereed from the perspective of a reader who will have the full information and can interpret statements in terms of knowledge of the author or authors.

In terms of these dimensions and the discussion in this article, publications in an effective digital journal should be public, archival,

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moderated, available to be sent automatically, in a standard format, with content fully accessible, supporting multi-media, permanent, immutable, authenticated, registered, indexed, annotatable, and attributed. None of the current applications of Internet satisfies all these requirements, and no past or currently established digital journals satisfies them either. However, none of them is now technically difficult to satisfy.

An Agenda for Digital Journals

This section stands alone as a statement of objectives for the development of digital journals, based on the discussion of the preceding sections, but summarizing it in terms of action points rather than derivations.

- A1.** To enhance scholarship by systematically improving the creation, dissemination and utilization of knowledge.

The difficult concept here is "systematic improvement" which may seem impossible given the anarchy of knowledge creation processes, and undesirable, given that much of that anarchy may be essential to innovation. However, it is the very fact that we recognize these issues that makes it reasonable to attempt to support knowledge processes systematically, including the freedom to innovate without constraints. We can use the capabilities of information technology to allow the media supporting scholarship to evolve from being passive

repositories to becoming the life worlds of our nomadic knowledge products, and this means supporting the continuing evolution, and co-evolution with ourselves, of the knowledge worlds that we create.

- A2.** To improve the productivity of individuals and groups generating and using knowledge.

We should not assume that improvements in the processes of recording and disseminating knowledge will automatically result in improvements in scholarship. It is important to establish the requirement for advances in the technology in terms of support for the knowledge processes of individual scholars and communities of scholarship. In particular, these processes should be studied in depth, and the impact of new technology on them should be monitored with a view to continuous improvement and enhancement of services.

- A3.** To reduce the adverse impact of the growth of knowledge by improving access to knowledge sources.

The major problem currently is not the lack of opportunities to publish but the information overload created by the growth of knowledge and the freedom to publish. The capabilities to organize, index, search and use knowledge in digital form are most important in the design of digital journals. For example, it would be absurd to design

digital publications in which the user did not have complete freedom to analyze and restructure the published material. Facsimile-style replication of paper publications might speed access to the material but it would be a short-term expedient that does nothing to alleviate the fundamental problem of information overload.

- A4. To increase the speed of knowledge dissemination.

The processing lag between a publication being available in draft form and being published in journal form is several years in many disciplines, particularly for the most highly regarded journals. Scholars attempt to overcome this by informal dissemination of manuscripts and this process should be supported through digital archives.

- A5. To increase awareness of relevant material.

All forms of dissemination, and particularly the informal availability of material prior to formal publication, are ineffective unless potential users are aware of the existence and availability of the material. The indexing of archives should be supported through the evolution of increasingly effective information retrieval systems taking advantage of access to the full text of the material.

- A6. To maintain openness of access to material.

Concern has been expressed about the development of electronic cliques in which senior scholars maintain a discourse which is not open to others, either because they are unaware of it or because they are not allowed to join. There will always presumably be discussions which are appropriately private or confidential for good reasons. However, it is important to support and encourage the open access to knowledge which is already part of the culture of scholarship and of our society's attitude to knowledge. Digital communications have the advantage of supporting the critical discussions commonly associated with workshops without the physical restrictions on attendance that limit participation in conventional meetings. Experience with current mailing list servers shows how much can be learnt from access to the ongoing discussions of major scholars about critical issues, and it is important that this type of peer commentary be supported and encouraged in the operation of digital journals.

- A7. To improve access to existing knowledge.

A critical mass of material available in digital form will be most rapidly achieved through incorporation of conventionally published material as soon as possible. In particular, pre-circulation and parallel publication of material to be pub-

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lished in paper journals should be encouraged by establishing public archives in which scholars may deposit their publications, including already published material.

- A8.** To increase cross-disciplinary access to knowledge.

Much of the compartmentalization of scholarship can be attributed to the need to manage the growth of knowledge and avoid information overload. New developments should not take current disciplinary boundaries for granted, but should question their roles and placement. In particular, there will be scope once large amounts of material are available digitally for new approaches to the structuring of knowledge, and these should not be impeded.

- A9.** To support the development of overt conceptual structures for knowledge.

Past media have encouraged the linear presentation of material and the implicit embedding of argument structures within the text. Digital media give scope for major innovations in presentation, such as labelled hypertextual links, and the shadowing of informal arguments by formal and operational ones using techniques of artificial intelligence. It is probable that few of the experiments in hypertext and computer-based knowledge representation to date will prove to be effective in the long term, and that the major innovations are yet to come in-

volving approaches not yet developed. Innovation and flexibility in the use of digital media should be encouraged, and explicitly supported, not impeded.

- A10.** To use modern information technology to support the achievement of these objectives.

This is perhaps a rather obvious presupposition to the preceding objectives, but it is proper to place it late in the sequence as the servant to the other objectives, not their master. We will always have much activity that is 'technology-driven' where those who see the elegance and potential of new technologies attempt to deliver it in useful form. However, it is important to balance the technology thrust with thoughtful planning that is 'market-led' where those who see the essential needs of scholarship attempt to mobilize appropriate technology.

- A11.** To support existing innovations in scholarly communication.

Ease of access to existing network services had allowed many scholarly communities to develop new modes of operation on an informal basis. This makes available valuable empirical data that is important to the development of effective digital journals. In particular a perspective that sees the digital journal as a formalization of this network discourse, in the same way that paper journals formalized postal and verbal

discourse, is a useful counterbalance to one that sees digital journals as the emulation of existing paper journals.

- A12.** To minimize the disruptive aspects of the introduction of new technology.

Much of the 'human factors' of the introduction of digital journals is subsumed in this statement. Designs that are based on existing usage of word processors on personal computers and existing access to networks are far more likely to succeed than those that require major changes in existing technologies or work practice.

- A13.** To maintain flexibility allowing enhancements in technology and changing requirements to be incorporated with the minimum of disruption.

Digital systems can be designed for change with automatic conversion between standards and continuous enhancement of capabilities without disruption of services. Often, however, they are not and flexibility should be stated as an explicit requirement.

- A14.** To encourage cooperation between those operating existing media and services and those developing new approaches.

Digital journals not only have close relationships to existing journals, their editors, refereeing systems, authors, readers and publishers, but also to a wide range of associated activities such as abstracting, indexing and information retrieval services, and to many

aspects of library services and librarianship. It would be of greatest service to scholarship to mobilize the knowledge and resources available through these existing institutions to develop digital journals as expeditiously and effectively as possible. It is possible that some of those potentially involved may see the new medium as a threat and not be prepared to cooperate, but it would be counterproductive to presume lack of cooperation in advance. There is most to be gained in the short term by sharing information, resources and opportunities and attempting to enhance scholarship through open collaboration on a professional basis.

- A15.** To prevent any abuses of monopolistic control or copyright legislation that restrict developments in scholarly discourse.

The community of scholarship at large should be made aware of the new possibilities for the dissemination of knowledge and mobilized to protect them from abusive practice if necessary. Ultimately, scholars are the major producers and consumers of knowledge and in a position to regulate the market place to the best advantage of the community at large.

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Action Plans

The action points in this section are intended as examples to focus attention on a number of simple initiatives open to the scholarly com-

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munity that could develop digital publication services by mobilizing existing resources at a minimum cost and with a high chance of success.

P1. A Digital Journal Consortium

Establish a digital journal consortium as a loose confederation of interested parties communicating through Internet with a view to sharing ideas and technology, encouraging necessary developments and supporting experiments with digital journals.

This is a typical Internet activity and has the usual advantages of mobilizing a diverse community without requiring a central power base, and of completely transcending national and disciplinary boundaries. This consortium can have fruitful collaboration with those concerned with document standards, multimedia communication, groupware and so on. It will serve to facilitate change and the evolution of *de facto* standards through experience. The actual operation of particular journals will be through editors, anonymous reviewers, commentators, and so on, as it is now, and it is important that these disciplinary communities have access to reliable, fully functional technology which they can use without responsibility for development and maintenance. It is probable that the first communities attracted to digital publication will be those with specific requirements better served by digital, rather than paper, publication, and it is important that such requirements are identified and addressed. It is also probable that a printed form of

most digital journals will be required for the foreseeable future, and that support of printed output of a parallel paper publication should be treated as a major initial requirement.

A reference model for a digital journal emulating paper journals and significantly enhancing their features might be:

1. A community concerned with a sub-discipline founds a digital journal by defining the publication objectives, establishing a review board of relevant experts, and negotiating a paper-based publication arrangement with a book or journal publisher. It is assumed that the community already operates a list server and a gopher.
2. Potential contributors routinely put their working articles in their local archives making the knowledge rapidly available through ftp and gopher. The appropriate format currently is postscript since this supports full typography, diagrams and pictures, can be generated by virtually all word processors on all platforms, and can be read and printed using public domain programs on all common platforms. It is also annotable, searchable and reusable using Adobe's *Acrobat* technology (Seybold, 1993).
3. When a contributor wishes an article to be reviewed for the journal, he or she informs the editor by email of the location of that article.
4. The editor assigns reviewers, and also makes it known to the

community at large through the list server that the paper is subject to review so that anyone may comment on it.

5. When the editor has sufficient commissioned and other reviews, he or she sends them to the author with an editorial decision. It may also be seen as appropriate to make these reviews publicly available in the journal archives.
6. If the editorial decision is to publish without change, then the article is moved into the journal archives. It might seem reasonable just to put a pointer to the article in the journal directory of the community gopher, but copying the paper to archives is intended to create an immutable "published" version. If revisions are required, the author makes them and the process loops back to 3.
7. Annually, or by volume, a paper volume of the digital journal is published. This may become unnecessary in the long term, but currently, such parallel publication is essential to make the published material universally available.

P2. Publication Archives

Establish public publication archives in which scholars can place digital versions of works published in peer reviewed paper journals.

These archives should support authentication so that the copies obtained from them can be distributed with the means to check that they have not been edited. Generic archives for all disciplines and publi-

cations are suggested so that they can be put in place rapidly without dependence on action in particular disciplines. Restriction to published works is suggested so that the archives do not become overloaded with material or have to establish their own moderation procedures. This suggestion relies on scholars having the right to make whatever use of their material they see fit and is an extension of the existing practice of distributing reprints. It seems unlikely that even publishers who do not explicitly return this right will object to the archives. Most scholars would assume that they have this right anyway and would not continue to publish in journals whose publishers attempted to claim otherwise. Note that the works would not be placed in the public domain and that the scholars and publishers would retain their copyrights. The use of material without due acknowledgement is very easy to detect in digital publishing and offenses ranging from professional discourtesy to outright plagiarism would be much more visible than they are now.

P3. Public Indexes to Personal Archives

Establish public indexes of personal or institutional archives of material that has not been peer reviewed.

This is intended to support the current practice of placing submitted manuscripts, draft documents, reports and data in public archives under local control, but to make the contents more accessible to the community. It balances the restriction of the publication archives above to articles published in peer

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reviewed journals by supporting any amount of publication based on the resources of the author or his or her institution. Permanence, immutability and authentication should be encouraged in these archives, but these can also be achieved by setting up sub-archives that transfer selected material from the personal archives, probably operated by some disciplinary sub-community.

These three action plans are complementary and together, including also current network activities, they would give an adequate basis for a major acceleration of the progress towards digital publication. They form a basis for the development of extended services based on content searches, hypertext linkage of peer commentary, knowledge structures for disciplines, and so on. However, before these new developments occur we need a critical mass of material available on the net and a significant community of scholars drawing upon it on a routine basis. That has to be our first practical objective, and is that addressed most directly by these three action plans.

Conclusions

Publication in paper journals is still the major system supporting human knowledge processes. If computer-based systems are to have any significant longterm impact on human knowledge processes, the functions of the paper journal have to be subsumed and enhanced. To do so effectively requires deep understanding of the social processes underlying scholarly activities and publication, their support through

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the existing publication and library systems, and how that support can be emulated and enhanced through computer and communication technology.

Social and Technical Dimensions of Electronic Journals

(continued)

Acknowledgements

This work was funded in part by the Natural Sciences and Engineering Research Council of Canada. Further material on related topics is available in the archive <ftp:cpssc.ucalgary.ca> in the directory pub/KSI. ■

Information Resources at the King's Fund Centre

**Margaret
Haines-Taylor**

*Head of Information Resources
King's Fund Centre
London*

What is the King's Fund?

In 1897, in order to celebrate Queen Victoria's Diamond Jubilee (and in an effort to improve his public image), the Prince of Wales established an endowment fund – the Prince of Wales Hospital Fund – to generate money for London hospitals. Interestingly, one of the largest donations to this Fund came from a Canadian, George Stephens, who was President of the CPR and the Bank of Montreal and who later became Lord Mount Stephens. The total contribution from Lord Mount Stephens and from his estate to the Fund was over £1.3 million. There still is a Canadian connection with the Fund but it is more of the 'blood, sweat and tears' type from the author of this article!

Upon the coronation of Edward VII in 1902, the fund was renamed the King Edward's Hospital Fund for London. It still bears this name although it is more popularly known as the "King's Fund". With the creation of the National Health Service in 1948, the Fund stopped giving money directly towards the operational costs of London hospitals. However, it continues to fund projects that carry out the 'spirit' of its charitable objects, namely, to improve the health needs of Londoners.

The King's Fund is now a large, wealthy charity with assets of over £180 million. It no longer raises money through public appeals but it does still receive bequests and also attracts project-linked monies from the government and other charities. It spends a proportion of its income

on subsidies to its three operating divisions, but it also gives out grants totalling over £2 million annually.

The three divisions of the Fund are the King's Fund Centre, the King's Fund College and the King's Fund Institute:

- The Centre is a service development agency that encourages innovation and good practice in health and social care.
- The College offers management training and related activities for the health service and organisational development consultancy services.
- The Institute is devoted to health and social policy analysis.

These three divisions are currently located on two sites in London but will relocate to a single London site in 1995.

Where does Information Resources fit in?

Information Resources is part of the King's Fund Centre. The Centre works with health and social care organisations, voluntary organisations, users of services and carers. It encourages people to try out new ideas by providing practical and financial support for projects and by disseminating the results of these projects through workshops, publications and information services. Besides service development work, the Centre is also a conference facility hosting over 600 conferences annually, and a publishing house producing over 30 titles annually. The service development work is

done by four teams which cover different sectors of health and social care: community care, nursing developments, reshaping hospitals and primary care, and information resources.

Information Resources is the largest department within the Centre with seventeen staff, fifteen of whom are professional librarians. It includes a fully automated public reference library which is totally subsidised by the King's Fund and three specialist information services which are funded by the Department of Health. It acts both as a national resource, providing wide-ranging information services on developments in health and social care, and as a support service to the staff within the Fund. However, it wasn't always so.

How we have changed!

In 1989, I arrived at the King's Fund Centre with a three year contract and a mandate to "automate, integrate, and create." I found a library with a 25 year history of excellent service to the NHS, but whose reputation was suffering because it could not keep up with the demand for its services. There had been a rapid increase in the number of enquiries due to the dramatic and fundamental changes in the operation of the NHS. In addition, I found other quite sophisticated and computerised information services operating in the Fund but these were linked to the Department of Health library and not to our own. Even if our Library had wanted to share data with the other information services, it was

not in a position to do so as it was not automated itself. The only computer equipment was an old Mellor-Data terminal which was used occasionally for online searching. This meant that the library staff were not able to benefit from other information work done within the Fund and inefficiencies in scanning literature, creating abstracts and indexing records were compounding the problem of the enquiry backlog.

As mentioned above, my task was to automate the library, integrate the information services with the library, and create a role for the new department which would be consistent with the Fund's mission and would make the most useful contribution within the broader community of information providers. After only two weeks on the job, I was asked to produce a three year forward plan! I did produce a plan and a mission statement:

"the purpose of the library and information service department is to support the education, research and service development activities of the King's Fund through the provision of a comprehensive, library-based information service on health care policy, planning and management."

I would have liked to have expressed the mission differently as it was so internally focussed on the Fund and so very library-oriented, but I had to do it on my own and in a short period of time, and it saw us through the first stage of our redevelopment. In later years, we have produced much better plans and broader mission statements mainly because of the groundwork

*Information Resources at the
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accomplished via the first plan and because they have been team efforts.

There were three key objectives in this first plan:

- improved access to information resources,
- strategic co-ordination of King's Fund information services,
- leadership in information provision.

I decided that the best way to improve access to information resources for our clients was to automate the library functions so that access was more efficient; clarify the collection policy so that clients knew what we could and could not do for them; and establish co-operative projects with other libraries so we could share the collection development burden.

The work automating the library has been reviewed elsewhere (Haines, 1992) so I will simply offer the highlights of our 18 months automation project which began in October 1990. We chose the UNICORN collection management system following a recommendation from a Canadian colleague and some extensive comparison with other systems. UNICORN is a full text retrieval system based on BRS SEARCH. We supplemented this with new BRS SEARCH software for the other information services which were being merged into the department so that records could be shared between the various databases. In the first 18 months, we implemented every one of the UNICORN modules, converted over 20,000 cards into machine-readable records, started a thesaurus

and began indexing all new records (the old card catalogue was classified and had no subject index terms), put the library database on the local area network of the Fund, trained Fund staff on searching the database, and developed user training packs for the OPACs. In the second 18 months, we completed the conversion of the databases for the existing information services into BRS SEARCH, developed new databases for a third information service which had just started, completed the thesaurus, and experimented with dial-in access for selected libraries and government departments. We hope eventually to provide online access via JANET or at least to produce a CD-ROM.

Our second approach to improve access to information was to clarify our collection development policy. Again, this has been covered in another article (Haines-Taylor, 1991) but in short, we spent the summer of 1990 reviewing our collection using the CONSPECTUS approach and then we revised our collection policy by identifying subjects where we needed to increase or decrease our coverage. A synopsis of these decisions and a listing of the conspectus levels for each classification code was also prepared. This gave our acquisitions staff more guidance in buying stock and helped other libraries and our own users understand what we felt our subject mandate to be.

My experience in Canada as part of the Hamilton-Wentworth Hospital Library Consortia and the Ottawa-Hull interlibrary loan network had convinced me that we should not 'do it alone' even though our library was

not naturally part of an existing library network, i.e. not part of the NHS, not an academic library, not really a public library, etc. There were, however, two libraries with similar collections and clients and both were also acting as quasi-national libraries. These were the library at the Department of Health and the Information Resource Centre at the Nuffield Institute for Health, which is part of the University of Leeds. Discussions with the Directors of these two libraries revealed a common belief that collaboration would reduce the workload for each library not only through sharing catalogue records and through co-operative collection development, but also through encouraging more enquiry referrals between us and thus sharing the expertise of our staff. In addition, we would be able to provide our users with access to a greater range of information resources by developing complementary collections and sharing them, and we could also take on projects as a consortium which we could never manage individually. In 1992, the Healthcare Management Information Consortium was born (Haines, 1993).

The second key objective in the forward plan was the strategic coordination of the King's Fund information services. By the time I got around to looking at this one, there were already three information services in the Fund: the Quality Assurance Information Service, the Medical Audit Information Service and the Nursing Audit Information Service, with a fourth on the way – the Services for Health and Race Exchange (SHARE). The first three were part of other Centre teams

which were run by non-information professionals. I had written an information strategy for the Centre which had recommended merging these information services with the Library and had also set up an information strategy working group which included representatives of these information services as well as the College Librarian. Despite early teamwork problems caused by this forced marriage, the new Library and Information Services department did eventually grow into a more cohesive team. Most of the credit is due to the staff themselves who worked hard at team building on our second retreat, passionately debating missions and service objectives. It was this retreat which resulted in our new name "Information Resources" adopted unanimously to portray a single department with a common purpose – the provision of information resources to clients.

Other initiatives that attempted to facilitate greater coordination of information provision within the Fund included a 'team librarian' service to the service development teams (much like clinical librarianship), and an information audit of Fund contacts databases and mailing lists which resulted in senior management support for the department taking the lead on creating a common contacts database on the network. The department continues to be active in promoting better information management practices within the Fund.

The final key objective in the plan was also the last to be addressed and that was defining a new role for the department within the broader com-

*Information Resources at the
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(continued)

munity of information providers and one that fitted well with the main work of the Centre. The staff were keen to show leadership within the information profession by participating in professional associations, making presentations and writing for library journals. We have been very successful in these endeavours and have shared with our colleagues the results of many of our internal projects. However, these initiatives were still very much internally focussed and did not match the service development approaches of the rest of the Centre closely enough. The work of the Consortium and its efforts to lobby policy makers for more strategic planning of information services at a national level was a step closer but still too ad hoc to be described as a role. My staff and I decided that we wanted to launch a service development programme focussing on the use of information in the NHS.

To help refine our focus, I had several meetings in late 1992 with the Director of the Centre, the service development programme directors, and the Management Committee for the Centre. I used soft-systems methodology and drew a 'rich picture' for them of the state of information provision in the NHS and our role in it. The use of this visual technique appealed to my various audiences and resulted in excellent suggestions which consistently steered us away from being an ever-enlarging national information centre and towards limiting our provision exclusively to other libraries and information providers whilst specialising in service development work on information management policies and audits.

This strategy would build on work we had already done for the Fund itself, and if successful with external clients, would improve the use of information within the NHS and could also give us the opportunity to promote libraries as important partners within the NHS information network.

We have been fortunate in winning a contract to take on a major information management review for an NHS Regional Health Authority, and have also consulted on regional library services for another. We are still having to charge for these consultancies and hope that in the future we will be able to attract grant money from the government to run these service development projects at no cost to the clients which is the pattern for most of the service development work done by the Centre. This would mean that those organisations most in need could potentially benefit instead of only those who can pay. We have some way to go to prove ourselves capable of this type of work before grants are likely to be forthcoming.

Where we are now

The first three year forward plan carried us through a time of tremendous change both within the department and within our client group in the NHS. The second plan is underway and is much better due to the efforts of the staff, particularly the Library Services Manager, the Information Services Manager and the SHARE Project Manager. Our new plan includes a new mission statement which demonstrates how far

we have developed from a traditional library-based service:

"Information Resources seeks to improve the quality of health and social care through the development and implementation of user-focussed information strategies, services and networks."

Our current range of services and activities is described in our brochure most of which has been included in Appendix A.

We anticipate no major changes in the near future other than a merger of the College and Centre libraries when the Fund moves to a single site. Having been through such major change in the last three years, we are looking forward to a period of consolidation in most of our service provision activities and of modest growth in our service development programme. We will be continuing to explore opportunities to network with other

libraries and hope that this furthers the Fund's Canadian connections!

Appendix 1:

The King's Fund Centre is a service development agency which promotes improvements in health and social care. The Centre Information Resources department includes public reference library and specialist information services. We act as a national resource, providing wide-ranging information services on developments in health and social care, and we serve the information needs of King's Fund staff.

We aim:

- to improve access to information resources in health and social care through database and collection development activities;
- to support policy making and service delivery in health and social care through information dissemination, advice and referral;
- to facilitate better practice in the management of information through support for the development of library networks and information strategies.

In the library, we cover all aspects of planning, funding, managing and evaluating the delivery of health and social care services. Our library computer database includes books, Government reports and journal articles, as well as annual reports, NHS Trust documents, health circulars and community care plans. We are also a WHO Regional Office for Europe documentation centre.

Information Resources at the King's Fund Centre

(continued)

References:

- Haines M. The Year of the Unicorn: A review of the first year's experience with the UNICORN collection management system at the King Fund's Centre. *Program* 1992;26(2):165-176.
- Haines-Taylor M. Quality assurance and collection evaluation. In: Haines-Taylor M and Wilson T, eds. *Quality assurance in libraries: the health care sector*. Ottawa: CLA, 1991.
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*Information Resources at the
King's Fund Centre*

(continued)

As a result of Department of Health funding, we are also able to offer more comprehensive coverage of three subject areas through our specialist information services:

- Medical Audit Information Service
- Nursing Audit Information Service
- SHARE: Health and Race Information Exchange

Each of these information services maintains computer databases of bibliographic records and contacts (people and projects).

We try to ensure that our subject coverage complements rather than duplicates that of other libraries and information providers. Thus we work particularly closely with our partners in the Healthcare Management Information Consortium – the libraries of the Department of Health and the Nuffield Institute for Health.

We provide a comprehensive range of services:

- access to a reference collection of printed information on a wide range of health and social care service management
- photocopying facilities (self-service or staff-provided) of these library materials, within the Copyright, Designs and Patents Act 1988
- bibliographies from our own databases
- literature searches of the most relevant commercial databases
- advice and workshops, newsletters and other publications on our specialist subject areas
- networking on people, projects and organisations in our specialist subject areas
- consultancy on information services and on information strategy development
- active support to local library and information providers in providing information on health and social services management. ■

The revised strategic plan was created through the efforts of all the chapters and was presented and passed at the Annual General Meeting in Banff, this June. There was consensus that the direction prescribed in the plan is a vision shared by the membership. The plan will guide decision making and, in itself, is always subject to change.

Goal 1: To provide opportunities and encouragement for the professional development and continuing education of CHLA/ABSC members.

Objectives:

1. To foster CHLA/ABSC Chapter CE activities by providing funding opportunities.
2. To facilitate information exchange among members.
3. To identify CE resources and contacts.

Action Plans:

1. Investigate establishing a fund to which chapters will be encouraged to apply in order to develop/mount CE courses or workshops.
2. Establish a clearinghouse which will collect and distribute practical library forms, brochures, etc.
3. Explore options for regularly distributing to chapters a roster of currently available speakers and topics.
4. Pursue conjoint CE programming with other organizations.

Goal 2: To foster and support CHLA/ABSC chapter development and ensure cooperation between the

chapters and between the Board and the chapters.

Objectives:

1. To enhance communication between the Board, chapters and members.
2. To encourage the development of networking and local resource sharing initiatives within and between chapters.

Action Plans:

1. Regularly make known to chapters that there is funding available for the development of local resource sharing projects.
2. Ensure circulation of chapter newsletters to other chapters and the appropriate Board members.
3. Investigate options for encouraging development and distribution of union lists within and between chapters.
4. Investigate the possibility of all health sciences libraries contributing to a national serials union list.

Goal 3: To promote the recognition of health libraries and health information services.

Objectives:

1. To encourage research that contributes to the information base of the profession and that demonstrates in quantitative terms the value of the library and its services.
2. To ensure that the value of health information services are well documented and publicized to the larger health community.

CHLA/ABSC Strategic Plan: Recommitment to Change

*CHLA/ABSC Strategic Plan:
Recommitment to Change*

(continued)

3. To ensure that the achievements of CHLA/ABSC members are well publicized.

Action Plans:

1. Establish an annual award for Excellence in Hospital Librarianship.
2. Initiate and support the development of research.
3. Public Relations Board member to develop and update annually a promotional package to be distributed from the Secretariat as requested.
4. Create a mechanism for responding to members' or chapters' difficulties on a timely basis.

Goal 4: To ensure a strong presence in the development of hospital library and information standards.

Objectives:

1. To take a strong, proactive role in the development of sound hospital library standards within the CCHFA standards.

2. To revise, update and publicize the CHLA/ABSC standards document.

Action Plans:

1. Create a Task Force whose role would be to work with CCHFA in identifying and responding to changes in the standards that apply to hospital libraries.
2. Revise and update the CHLA/ABSC Standards document as required.

Goal 5: To enhance communication with other library associations.

Objectives:

1. To establish, as appropriate, beneficial relationships with other organizations which promote the aims of CHLA/ABSC.

Action Plans:

1. Approach other library associations to explore the possibility of exchanging publications, and co-sponsoring programs and CE courses.
-

Introduction

The CHLA/ABSC Development Fund was created in June 1993 at the time of the Banff pre-conference Board Meeting. The Fund is designed to support initiatives by chapters and individuals and provides a tangible way for the Association to foster growth at the local level.

The CHLA/ABSC Development Fund complements the existing CHLA/ABSC Tenth Anniversary Commemorative Award. Both the Development Fund and the Tenth Anniversary Commemorative Award recognize activities which further the mission of CHLA/ABSC. The Tenth Anniversary Commemorative Award, which is offered annually in the amount of \$500.00, will continue to recognize CHLA/ABSC chapter activities which have been completed or are in progress. The activity or activities may represent the efforts of one year or of several years.

The CHLA/ABSC Development Fund will be awarded to chapters or to individuals whose projects meet the criteria for funding. Projects funded by the Development Fund will normally be new and more focused projects which have definitive start and completion dates. Examples of such projects are:

- CHLA/ABSC chapter continuing education activities (e.g. development of courses and course materials, presentation of courses).
- CHLA/ABSC chapter activities of merit (e.g. publications, union lists, consortia develop-

ment, resource sharing, networking).

- Original research projects and studies which promote excellence in access to information.

The amount of money allocated to the Development Fund shall be set by the Board of Directors annually at the Fall Board Meeting for the following fiscal year. The amount allocated to the Development Fund normally will not be less than \$2000.00.

The Board shall review all applications for grants from the Development Fund and may award grants at its discretion. The value of any grant awarded will be set by the Board of Directors according to the contribution of the project to the mission of CHLA/ABSC and the availability of funds in the Development Fund.

Recipients of grants from the Development Fund will be expected to submit a report about the project or activity to the CHLA/ABSC Board of Directors upon completion of the project. A summary of the project will also be required for publication in BMC.

Unused portions of grants provided from the Development Fund must be returned to the Association upon completion of the project or activity for which the grant was supplied.

Procedures for Application

Applications for grants from the Development Fund must be submitted at least one month before the next scheduled CHLA/ABSC Board meeting. Board meetings

Terms of Reference: CHLA/ABSC Development Fund

*Terms of Reference: CHLA/ABSC
Development Fund*

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normally are held in February, June and October of each year. Guidelines for application submission are outlined on the following page. (Editor's note: please apply to a member of the Board or your chapter president for a copy of the Guidelines.)

Applications should be sent to the current CHLA/ABSC President with a copy to the Secretary. Applicants will be notified of the disposition of their application shortly following the Board meeting at which the application is considered. All enquiries and correspondence concerning the award should be directed to the CHLA/ABSC President.


Review Criteria for Applications

All requests for grants from the Development Fund will be

reviewed using the following criteria:

1. Contribution to the improvement of health and health care by promoting excellence in access to information.
2. Benefit to the professional development and/or professional practice of CHLA/ABSC members.
3. Originality of the proposed project or activity.

In addition, requests for research funding will also be evaluated using the following additional criteria:

4. Appropriateness of research project design and evaluation methods.
 5. Apparent ability of the research project leader to successfully complete the proposed project.
- 

Definition: CHLA/ABSC courses referred to in this policy are those that have been developed under the direct sponsorship of the Association in compliance with the CHLA/ABSC guidelines for the Development of Continuing Education (CE) Courses. Other CE courses that may be offered by CHLA/ABSC but have not been directly sponsored by the Association are not covered by this policy.

Procedures: As stated in the CHLA/ABSC Guidelines for the Development of Continuing Education (CE) Courses, a proposal must come forward from the course developer(s) to the CHLA/ABSC Board outlining the details of development, including, but not limited to, the following:

- The course name and its objectives,
- A brief abstract of the course,
- The anticipated number of contact hours,
- A proposed budget for the development of the course, including a request for subsidization by the Association,
- A timetable covering the period from the initiation of work to the expected date of completion,
- A plan for marketing the course.

Upon acceptance of the CE course development proposal, the CHLA/ABSC Board will approve a budget allocation for the development of the course and appoint one or more members of the Board (including the CE Coordinator) as liaison with the course developer(s).

The liaison(s) is/are expected to work closely with the developer(s) throughout the development of the course. It is anticipated that the Association will cover costs involved in communication (telephone, E-mail, fax, courier, etc.) and in meetings between developers, if necessary, and in printing or producing course materials.

A progress report from the developer(s) will be submitted for each Board meeting until course development is completed.

Ownership: Because the course is developed under the direct sponsorship of CHLA/ABSC and with its financial assistance, the course and all related materials will be recognized as being the property of the Association. The Association will be acknowledged on all promotional materials.

Presentation of the Course: Organizations and/or individuals who are interested in sponsoring a presentation of the course should contact the CHLA/ABSC CE Coordinator. The CE Coordinator will review the request in light of the Association's goals and objectives. The CE Coordinator will make all arrangements that directly involve the Association (eg. selecting and contacting the instructor, arranging for CE certificates). The course instructor will make all arrangements for the course presentation, including negotiating the instructor payment fee. (For guidelines on payment to course instructors at CHLA/ABSC events, refer to the current CHLA/ABSC Conference Planning Guide).

CHLA/ABSC CE Course Development and Delivery Policy

CHLA/ABSC CE Course
Development and
Delivery PolicyT

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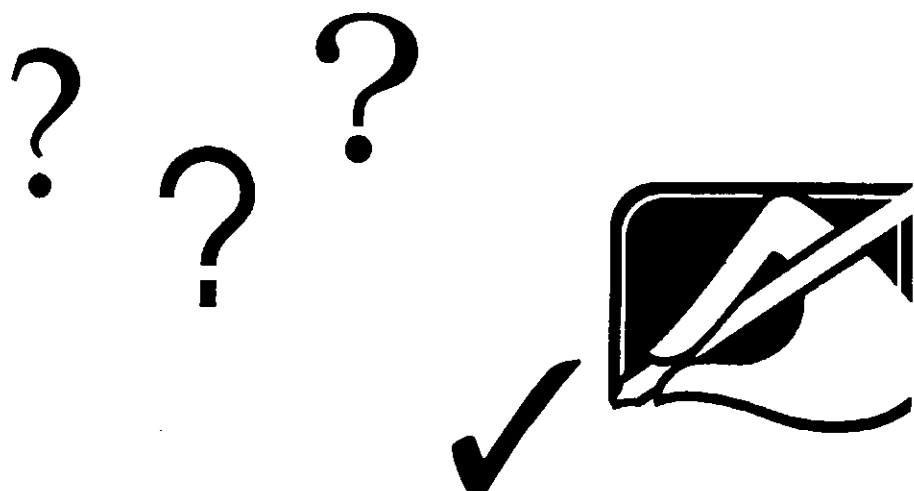
Presentation of the Course to Nonmembers: This part of the policy recognizes the financial contribution of CHLA/ABSC members to the development of the course. The costs of registering for a course to participants who are not members of CHLA/ABSC will be higher than to those who are members. The Board recommends that the registration fee for nonmembers be 25% higher than for members.

Royalty Payments: The Association will not charge a royalty to sponsors who are institutional members or units (eg. chapters, annual conference CE committees) of CHLA/ABSC. Where the sponsoring body is not an institutional member or unit of CHLA/ABSC, the Association will impose a royalty payment. This royalty payment, which is to be returned to CHLA/ABSC, will be not less than 25% of the net profits from the

course. The CHLA/ABSC CE Coordinator will ensure that the appropriate royalty fee is agreed upon and payment arrangements put into place when approving a request to sponsor a presentation of the course.

Certificates: Certificates for CE contact hours are available from the CE Coordinator. A fee for CE certificates will be levied at a rate that ensures that the costs of printing certificates are returned to the Association. It is the responsibility of the sponsoring body to complete and distribute the certificates.

Summary of Course Presentation: Upon completion of a presentation of the course, the sponsor shall provide the CHLA/ABSC CE Coordinator with a report on the course presentation. The report shall include the number of attendees and a summary evaluation of the course. ■



What's Your Library Like and Does it Use WMS?

Susan E. Hendricks

*CHLA/ABSC WMS Liaison
Education Resource Centre
Oshawa General Hospital*

These are, indeed, difficult times. As we approach the federal election, many wonder if our present health care system will survive. Certainly, changes are in the air, and for this reason it becomes increasingly important for libraries to be able to justify their financial positions and staffing patterns.

Workload measurement is one tool libraries have at their disposal to prove the worth of their service. At the same time, it takes some investment of our time to be able to realize this dividend. CHLA/ABSC has also invested a great deal of its time and money to devise a workload measurement system for its members. Now is the time for us as an Association to evaluate what has become of that system and whether or not it has been of any use to you.

Members of the former CHLA/ABSC WMS Task Force were involved in creating the questionnaire that is included in this issue of BMC. We need to know about you, your library and the degree to which you have implemented WMS to assist us in planning future directions. Please take a few minutes of your time to fill in the questionnaire and return it to me at the address listed on the covering letter of the questionnaire no later than November 15/93. The results of the questionnaire will be published in the next issue of BMC.

Thank you all for your cooperation. ■

CHLA/ABSC HEALTH LIBRARY SURVEY

1 Name of respondent

Name: (please print)	Title
Qualifications: Please indicate highest education level: MLS, BLS, BA/BSc; College Diploma; High School Diploma; Other - please specify.	

2 Name of Institution

Name of Institution:		
Address		
Telephone #:	Fax #:	Email:

3 CHLA/ABSC Health Care Facility Category¹

Please circle:	A	B	C	D	E
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4. Type of Facility

Please check (✓) as appropriate:	
<input type="checkbox"/> Teaching hospital	<input type="checkbox"/> General Community Hospital
<input type="checkbox"/> Acute Care Facility	<input type="checkbox"/> Long term Care Centre
<input type="checkbox"/> Other (please describe)	

5. Library staff:

Please insert appropriate numbers expressed as full/part-time equivalent:	Have you had cuts in your staffing levels over the last 2 years? Yes <input type="checkbox"/> No <input type="checkbox"/>
<input type="checkbox"/> Professional	If yes, indicate how many f.t.e. have been reduced:
<input type="checkbox"/> Technical	
<input type="checkbox"/> Clerical	
<input type="checkbox"/> Volunteers	

6. Equipment/Technology

Please check (✓) as appropriate:		
<input type="checkbox"/> Automated technical services	<input type="checkbox"/> CD-ROM	<input type="checkbox"/> Electronic mail
<input type="checkbox"/> Telefacsimile	<input type="checkbox"/> Computer-assisted work-stations	<input type="checkbox"/> Word Processing

¹ Canadian Health Libraries Association. Task Force on Hospital Library Standards. *Standards for Canadian Health Care Facility Libraries: Qualitative and Quantitative Guidelines for Assessment*, 1989, pp. 44-60. Toronto: CHLA/ABSC, 1989.

7. Library User Services

Please check (✓) all user services that you offer:	
<input type="checkbox"/> In-house online search services on Medlars and other databases <input type="checkbox"/> Medline on CD-Rom <input type="checkbox"/> Access through external services to MEDLARS <input type="checkbox"/> Bibliographic Instruction <input type="checkbox"/> User education on storing, accessing and retrieving electronic information <input type="checkbox"/> Current awareness services <input type="checkbox"/> Orientation to library services and resources <input type="checkbox"/> Provision of Information <input type="checkbox"/> Photocopy facilities in the Library <input type="checkbox"/> Interlibrary loan services <input type="checkbox"/> Document delivery	<input type="checkbox"/> End-user support <input type="checkbox"/> Preparation of acquisitions list <input type="checkbox"/> Referral for specialized services, e.g. translation <input type="checkbox"/> Verification of reference citations <input type="checkbox"/> Coordination of health sciences literature/resources or the hospital <input type="checkbox"/> Clinical health librarian program <input type="checkbox"/> Patient education/consumer health information services <input type="checkbox"/> Library training for students <input type="checkbox"/> Exhibits in library <input type="checkbox"/> Index to research in progress in the health care facility <input type="checkbox"/> Other (please describe)

8. Has your library undertaken any workload measurement time trials?
☐ Yes ☐ No
8a. If YES, indicate which functions/services you have studied:Have you submitted the results to the WMS Liaison? ☐ Yes ☐ No**8b.** If NO, indicate if you plan on implementing a workload measurement trial in:
☐ the next six months ☐ the next year ☐ the next 2 years? ☐ have no plans for the foreseeable future

What has prevented you from implementing a workload measurement trial so far? (Check all that apply)

☐ Lack of knowledge ☐ Lack of time
☐ Lack of resources ☐ Dissatisfaction with proposed CHLA/ABSC WMS Methodology
☐ Lack of staff
☐ Other: Please elaborate:**9. Additional Comments:**

Thank you for your assistance in filling out this questionnaire. Please complete this form and return to:
 Susan E. Hendricks, CHLS/ABSC WMS Liaison, Library Services, Oshawa General Hospital, 24 Alma Street, Oshawa, ON L1G 2B9.

Letter to Mr. Sheldon Kotzin, National Library of Medicine

Jennifer Bayne

In the context of discussion about the NLM surcharges at the annual general meeting in Banff, Jennifer was asked what, if any, response CHLA/ABSC had made to NLM. Jennifer replied that she had written to Sheldon Kotzin, Chief, Bibliographic Services Division, NLM on behalf of the Association expressing the concerns about the proposed fee structure. The text of her letter is reproduced below:

May 12, 1993

Dear Mr. Kotzin,

As President of the Canadian Health Libraries Association/Association des Bibliothèques de la Santé du Canada, I am writing to express my opposition to the NLM policy regarding additional surcharges for foreign CD-ROM network users of your data. While I can understand the need to recover database creation costs, the policy proposed has the potential to jeopardize access to NLM data and hinder systems development. CHLA/ABSC would like to work with you to identify alternate solutions to concerns that fall into three main areas:

- lack of initial consultation prior to a major policy change. Though all health libraries should be involved in these discussions, "foreign" health libraries must be particularly represented, since there is a pricing differential made between U.S. and other users.
- the pricing policy as currently stated has severe economic implications for any foreign library trying to provide network access to NLM data. The costs involved in fact actively discourage use of the data and retard the provision of quality health care based on the easy availability of information. In addition, because of the late announcement of such a major policy change, health libraries have had little advance notice in which to plan for the cost and reporting changes proposed.
- the requirement for usage data is currently not feasible using the available CD-ROM software. The fact that this information is required in a networked but not in a single workstation environment suggests a bias against networked users.

We would urge you to reconsider the current pricing policy after the opportunity to discuss the implications with your foreign users, including Canadian health libraries. We have a number of representatives who would be willing to meet with you. Several of us will be meeting at MLA in Chicago also and we would be pleased to forward the results of that discussion to you.

I look forward to talking with you in the near future.

Yours sincerely,

Jennifer Bayne, MLS, MBA
etc.

cc. Lois Ann Colaanni, Associate Director, National Library of Medicine

Dr. D. Lindberg, Director, National Library of Medicine

Jackie Bastille, President, Medical Library Association

Maureen Wong, Canada Institute for Scientific and Technical Information

Sylvia Chetner, Chair, Special Resource Committee on Medical School Libraries,
Association of Canadian Medical Colleges

Please note: the National Library of Medicine refuses to contemplate any change in policy until an industry wide CD-ROM agreement is in place regarding networking issues. SilverPlatter, the largest player in this industry, is expected to have made an announcement by September, which should precipitate establishing policy in this area.

The new executive of the London Area Health Libraries Association was incorrectly listed in BMC 15(1):23. The new executive consists of:

President	Mary Gillet Library Services Victoria Hospital PO Box 5375, South Street Campus London, Ontario N6A 4G5 Tel: (519) 685-8500 x7717 Fax: (519) 667-6797 Envoy: M.GILLET Internet: mgillet@julian.uwo.ca
Past President	Linda Voelker
Secretary & BMC Correspondent	Mai Why
Treasurer	Leslie Ann Legge

Correction

The 1993 edition of the Union List of Selected Serials of the Manitoba Health Libraries Association is now available. It lists the holdings of eighteen health sciences libraries in Winnipeg. Copies are available for \$45.00 from:

Medical Library
University of Manitoba
770 Bannatyne Ave.
Winnipeg, Manitoba
R3E 0W3
Attention: Bev Brown

Craven J, Farrow S. **Surviving transplantation**. Toronto: University of Toronto Press, 1993.

"A personal guide for organ transplant patients, their families, friends and caregivers", written by a doctor and an occupational therapist from the Toronto Hospital.

\$16.95 per book — \$3.00 postage for 1 book; \$1.00 postage for each additional book. Make cheques payable to Surviving Transplantation. Mail to:

Surviving Transplantation
PO Box 339
London, Ontario
N6A 4W1

In the United States: Make cheques payable to the University of Toronto Press. Mail to:

Surviving Transplantation
University of Toronto Press
340 Nagel Drive
Buffalo, New York
14225

New York residents, please add 8%.

New Publications to Note

Telemedicine Canada Schedule

Health Libraries Series

All programs are broadcast on Fridays, between 1:10 and 2:00 pm Eastern time, and are moderated by Jill Faubert of Sarnia General Hospital. They are organized by Janette Hatton, Hamilton Civic Hospitals, Henderson General Division, and Patrick Ellis, Dalhousie University.

To register for a program, telephone (416) 599-1234 or fax (416) 598-1848.

Date: September 24

Code: 09074

Margot J. Montgomery, Director General of CISTI

*The Canadian Institute for Scientific and Technical Information's
Strategic Direction*

Date: October 15

Code: 10054

Elaine Boychuk, Associate University Librarian, Dalhousie University
Intermediate INTERNET: One Inch Past Basic

Date: November 5

Code: 11024

Anne Gravereaux, Director, Inquiry, Canadian Centre for Occupational Health and Safety, Hamilton
Health and Safety in the Library

Date: November 26

Code: 11099

Alix Hayden, Librarian, Medical Information Service, University of Calgary
Alberta's Medical Information Service

Date: January 21

Code: 01024

Peggy Ross, Librarian, St. Peter's Hospital, Hamilton
A Library in a Geriatric Chronic Care Facility

Date: February 11

Code: 02044

Grace Paterson, Medical Informatics Coordinator, Dalhousie University
INTERNET: Resources for Problem Solving in Health Care

Please note that there will be a repeat of the Introduction to INTERNET in the Spring schedule in response to demand.

New Consumer Health Series

All programs are broadcast Fridays, from 10:00 to 10:45 Eastern time and are moderated by Joanne Marshall and Jennifer Bayne.

Beginning this fall, CHLA/ABSC, with the Consumer Health Information Service based at the Metropolitan Toronto Reference Library, is cosponsoring a new consumer health series on Telemedicine Canada. The initial series was organized by Professor Joanne Marshall, Faculty of Library & Information Science at the University of Toronto, and Jennifer Bayne, Fudger Health Sciences Library Director, the Toronto Hospital.

The program planned for this year includes a variety of topics intended to be of interest to consumers, health educators and information professionals. We encourage you to sign up for the series and, if you wish, inform other people you know would be interested in these topics to attend.

If you have any questions or for additional information, contact Telemedicine Canada, Joanne Marshall or Jennifer Bayne.

Date: September 24

Code: 09071

Dr. Grant Farrow, Urologist, TTH and the University of Toronto
Prostate Trouble

Date: October 15

Code: 10051

Dr. Helen Batty, Women's College Hospital, Toronto
How to Choose a Family Doctor

Date: November 5

Code: 11021

Dr. Tom Wolever, St. Michael's Hospital, Toronto
Cholesterol Confusion: Facts About Fat in the Diet

Date: November 26

Code: 11096

Dr. David Caspari, Emergency Physician, TTH
The Checkup Checklist: What You Need to Know About Screening

Date: January 21

Code: 01021

Dr. Susan Abbey, Psychiatrist, TTH and University of Toronto
Chronic Fatigue Syndrome

Date: February 11

Code: 02041

Dr. Clive Mortimer, Ophthalmologist, TTH and University of Toronto
Laser Eye Surgery

Telemedicine Canada Schedule

(continued)



Upcoming Conferences

Pacific Northwest Chapter/Medical Library Association (PNC/MLA)
October 20-22, 1993

Benson Hotel
Portland, Oregon

The Vision: Looking Outward, Looking Inward.

Continuing Education: *Quickdoc beginning; Quickdoc advanced; Down the rabbit hole — an adventure into the Internet; Managing personalities in the library; CD-ROM networking fundamentals.*

Keynote Address: *Rachel K. Anderson, Director, Arizona Health Sciences Library, Chair, National Library of Medicine, Board of Regents. Health information challenges for the library: threat or opportunity?*

Program: *The Oregon plan; TQM; Internet panel; Demonstrating a commitment to change; Medline breakfast; Lunch with the MLA President; Information seeking behaviour of primary care physicians; New JCAHO standards and knowledge based management.*

Opening reception at Powell's Bookstore; Wine Country Tour.

\$140 members/\$150 nonmembers. Registration information: Madelyn Hall, Good Samaritan Hospital Library, 1015 N.W. 22 Avenue, Portland, Oregon, 97210, USA. ■

PUBLICATIONS

Standards for Canadian health care facility libraries: qualitative and quantitative guidelines for assessment, 1989

CHLA/ABSC Task Force on Hospital Library Standards

This report comprises the first substantial revision to standards for health libraries in Canada in a decade. The report took two years to complete and relies heavily upon data obtained during that period from health libraries throughout Canada; as such it reflected current health practices.

The report presents descriptive standards for libraries. To assist in the interpretation of these descrip-

tive standards are qualitative and quantitative guidelines, as well as an assessment form which can serve as as an overall audit for health libraries. Also included are an interpretation for small health libraries, sample terms of reference for library committees, detailed descriptions of the tasks and responsibilities of library staff at various levels, a selection of simple audits and a lengthy guide to physical planning.

Workload measurement systems : a guide for libraries, 1992

CHLA/ABSC Task Force on the CHA/MIS Guidelines

This publication marks the culmination of three years' work by the Task Force entrusted with the task of laying the groundwork for developing national guidelines for collecting data on library workload measures. It also constitutes the course guide for a workshop accredited by CHLA/ABSC and the Medical Library Association (MLA).

Readers are given a thorough grounding in the basic terminology and salient features of workload measurement systems (WMS). The

Guide contains detailed instructions on how to design and implement WMS programs to meet the disparate needs of libraries of various types and sizes. The value of WMS as a departmental management tool to assist in performance and budget monitoring is stressed.

Included in the Guide are sample data collection and assessment forms, a conceptual model delineating primary and secondary library functions and an annotated bibliography.

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Other relevant documents:

CHLA/ABSC Executive Manual

Instructions for Authors
(end of each issue)

Advertising Policy
(BMC 14 (3) 1993: 160)

Minutes of the CHLA/ABSC Board

Minutes of the CHLA/ABSC Annual General Meeting

Editors, the Board, the Association

Bibliotheca Medica Canadiana is edited by the Editor and the Assistant Editor. These two volunteer positions are appointed by the Board of CHLA/ABSC.

The Board is apprised of the ongoing operations of *Bibliotheca Medica Canadiana* by the attendance of one of Editors at the CHLA/ABSC Board Meetings. If attendance is not possible, a written report will be forwarded to the President of CHLA/ABSC at least one week prior to the first day of the Board meeting.

The Association members are apprised of the ongoing operations of *Bibliotheca Medica Canadiana* by the Editors' message in each issue of *Bibliotheca Medica Canadiana*. One of the Editors presents the *Bibliotheca Medica Canadiana* Editors' report to the Association's Annual General Meeting. Where neither editor can attend, it is their responsibility to ensure that the report is presented at the AGM. The

report itself is subsequently published in *Bibliotheca Medica Canadiana*.

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Bibliotheca Medica Canadiana
Editorial Policy

(continued)

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The editors of *Bibliotheca Medica Canadiana* welcome any manuscripts or other information pertaining to the broad area of health sciences librarianship, particularly as it relates to Canada.

Contributors should consult recent issues for examples of the type of material and general style sought by the editors. Queries to the editors are welcome. Submissions in English or French are welcome.

Contributions should be submitted on disk, preferably in WordPerfect format, and also printed in duplicate and the author should retain one copy. Contributions should be double-spaced and should not exceed ten pages or 3500 words. Pages should be numbered consecutively in arabic numerals in the top right-hand corner. Articles may be submitted in French or in English but will not be translated by the editors or their associates. Style of writing should conform to acceptable English usage and syntax; slang, jargon, obscure acronyms and/or abbreviations should be avoided. Spelling shall conform to that of the *Oxford English Dictionary*; exceptions shall be at the discretion of the editors.

All contributions should be accompanied by a covering letter which should include the author's (typed) name, title and affiliations, as well as any other background information that the contributor feels might be useful to the editorial process.

References

All references should be given in the Vancouver style; see *Canadian Medical Association Journal* 1985;132:401-5. Contributors are responsible for the accuracy of their references. Personal communications

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Information for Contributors

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